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# Light Show

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# Color Games

## *Light Show Manual*

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**Robert C. Beck**

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# Light Shows

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This LIGHT SHOW MANUAL is a 'HOW TO DO IT' report based on personal experience and observations of the author over the past decade.

A major adjunct to psychedelic "happenings," rock-and-roll performances, "in" parties, and "turn-on" scenes are the color effects grouped under the heading of "light shows." This imaginative use of color and light expanded greatly in the psychedelic scene, adding much to trips festivals, "GUAMBOS" (Great Underworld Artist's Masked Balls and Orgies), "freak-outs," and futuristic night clubs. Through such exposure it has finally emerged as a dynamic art form.

This brief report is an attempt to describe WHAT is being done, and HOW to do it yourself.

**HISTORICALLY-** Ancient history reveals that color and light played an important part in healing and mystical rites. The Druids constructed temples and apparatus to worship the sun. Solomon's temple was constructed in tiers of color effects. Egyptian temples were sometimes provided with shafts through which sunlight would beam during certain times and strike jeweled reflectors, pools of colored water, etc., and be scattered around the interior during ceremonies.

Bibliographies include works by Aristotle (384-322 B.C.) on color and light as art forms. Sir Isac Newton (1704) concentrated on "color music". In 1734, Father Castel wrote extensively on color projection concerts. Goethe (1819), Steiner, and hundreds of others recognized the possibilities of this art form.

Professor A. Wallace Rimington, R.B.A., A.R.E., finished a "color organ" in 1893, and ushered in the modern day applications of projection systems. In the U.S.A., Mrs. Mary Hallock Greenwalt was actively touring with "color concerts" using an elaborate instrument covered by many patents of her own design. Her activity spanned the years from 1903 to the early 1930's. Other major historical figures were Thomas Wilfred, who gave concerts here and abroad during the 20's, A.B.Klein, of Great Britain, and many others.

(For a comprehensive source of background data, the book "Coloured Light", which is the third edition of "Colour-Music" by Adrian Bernard Klein, M.B.E., A.R.P.S., The Technical Press Ltd., London, England, 1937, should be consulted. )

This report is a resume of instruments and effects most commonly used today.

**WET SHOWS . . .** In this category are grouped effects usually projected with overhead type projectors and liquid coloring materials. In early forms of this presentation (pre 1958) a transparent acetate sheet was laid over the image stage of an overhead projector, and various chemicals, dyes, water-colors, inks, stains, glycerine, syrup, beads, etc., were dropped, swabbed, flowed, etc., across the field. Surface tension would add movement as the puddles of fluid would "bead up" or creep across the field of view. After four or five minutes of this mixing and adding process, the operator would remove the acetate, replace it with a fresh plastic, and continue with new configurations. This was usually accompanied by live or recorded jazz, poetry readings, or "spontaneous sound". A number of performances of these early "wet shows" were to be found on weekends in the coffee houses of Venice West, the North Beach area of San Francisco, the Village in N.Y., and on the "Beat" scene generally.

Today's "Wet Shows" are much more sophisticated. A few highly skilled artists have emerged, giving truly professional performances. A description of one such artist, Dennis R. Wier, 3505 Pacific Ave., Venice, Calif., might be informative. During the early part of 1966 Mr. Wier ran a small classified ad in the Los Angeles Free Press :

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The advertisement appeared as follows:

LIGHT SHOW — a groovy psychedelic, moving, color fantasy with live music. 9-12 pm. \$1. 3505 Pacific Ave., Venice. Every Saturday night.

Each Saturday night, a number of people would gather at his apartment, and after paying admission, would be ushered into a bare room where they would sit on floor matts. Sometimes fifteen or twenty persons would be present. The walls of the room were painted flat white, and one was used as the projection screen. Performances, lasting about 20 minutes, were repeated several times each evening for fresh audiences.

One, two, or three musicians would participate on Mexican Harps, bell trees, percussive devices, gongs, flutes, etc., in a spontaneous sound of free-form music.

A shallow glass dish, about 18" diameter, would be filled to a depth of about 3/4 inch with water. This was positioned on the image stage of an old American Optical Co. 1000 watt incandescent overhead projector. Then dyes, stains, aniline colors, would be dropped into the fluid, and their ebbing and flowing color patterns would be projected on the far wall.

Sometimes Benzine, Methaline Dichloride, Carbon Tetrachloride, M.E.K., H.P.X., Sulfuric Acid, and other chemicals and solvents would be added to discrete areas of the liquid.

Colors could be Bromol Blue, Methylene Blue Stain, Neutral Red, Basic Fuchsin, water colors, food dyes such as Easter Egg colors from the supermarket, fabric dyes diluted to proper concentrations, inks, etc.

"Accent" colors were obtained by lightly sprinkled additions of potassium permanganate or basic red. As the minute particles would diffuse and sink, they would stir threads of color trails through the field.

Addition of the solvents would cause a churning, boiling effect on the screen. Non-soluable additions would result in globules or spheres of liquid which would mysteriously float across the screen. Mineral oil with Schilling food colors, alcohol, etc., were "accents".

Sometimes the dish was gently stirred at one periphery with a glass rod, or gently blown across with the operator's breath to produce currents in the solution. On occasion, some of the solution would be removed during the operation with a syringe. Late in each performance, the solvents and acid would be added for rather dramatic motion, swirling, and bubbling and churning displays.

**ADVANTAGES OF "WET" SHOWS:** A "new" image appears continually. With skill, each moment is an arresting display. It can be a slow, gentle, relaxing flow of images, or else by violently agitating a few cc of colored, non-mixing fluids between nesting concave dishes, an abrupt "splashing" series of images, timed to a music beat, can be produced.

**LIMITATIONS:** It is difficult to predict in advance just what effect will appear. At worst, the display is dull and tedious. After a short time (4-5 minutes) the liquid medium becomes cloudy and murky and dark because of the addition of different colors. Then the solution must be SIPHONED (never poured) out of the glass dish, the dish rinsed, refilled, and the whole process repeated. Chemicals are expensive, even in the relatively small quantities used. And even by "cheating" by interposing colored gels (plastic colored filters used for theatrical lighting effects) the color effects are not brilliant and saturated as compared with other systems. During even a half-hour show, the dishes must be emptied and refilled many times. And even with the most careful handling, the solutions will generally spill, drip, splash or spray over everything in the vicinity. Several of the coloring agents will permanently stain clothing, projectors, and surrounding areas. If the table is accidentally kicked or the dish sloshed, there is a disaster. Auditoriums having experience with this type of show insist on your spreading a plastic drop cloth in a ten foot circle around the operation.

**HINT:** If you wish to experiment, pyrex brand glass baking dishes are available in the ovenwear department of most department stores. A 12" diameter clear baking dish, 1-1/4" deep, costs

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under \$ 3.00. The most convenient way to handle the coloring solutions is by storing them in the 6 or 8 oz plastic "squeeze bottles". These are similar to the mustard and catchup containers at the hamburger stand. They can be obtained at any chemical supply house, or at Wholesale Supply Co., 1005 Lillian Way, Hollywood. Most commonly used dishes are nesting "watch-crystal" glass faces for wall clocks. You will also need glass stirring rods, eye droppers, syringes, and plastic buckets for waste disposal, as well as towels, etc. Don't be so naive as to think you can do this without making a mess; you can't. And don't try a wet show on a rented or borrowed projector, you'll generally mess it up with stains so badly that you'll have to buy it. Two or more concave dishes of different radii are nested for "splash" effects. The top dish is "mashed" into puddles of colored mineral oil, glycerin, alcohol, in the large lower dish.

**THE DR. HILL EFFECTS.** . For several years Dr. Henry Hill has been building and showing color instruments of his own design. These art forms have been popular at happenings and light shows in Southern California. In operation, the Dr. Hill instruments consist of enclosed rectangular boxes, with a "rear-projection" screen at one end, usually rectangular and perhaps 3' X 4' in size. On this screen, which is either made of layers of semi-transparent silk screen material, tracing paper used by draftsmen, or preferably milky translucent plastic, are projected patterns which move about and change in color.

The mechanism inside is a number of projection floodlights, preferably three in number, but sometimes up to eight or more. These are directed forward toward the screen. Immediately in front of the cluster of bulbs, spaced like an equilateral triangle, is rotated a color wheel made of segments of colored cinemoid brand plastic filters, red-green, blue, orange, and a small segment of yellow. This color filter wheel is driven by a Bristol timing motor of from 3 to 5 rpm.

Between the color wheel and the plastic screen, Dr. Hill places a large cardboard mask into which he has cut with a knife a series of patterns. Images of spirals, stars, shellbursts, circles, figures, jagged flare edges., etc., and other symbols are cut as holes in this cardboard mask; and as the three floodlights shine through these cut-outs and strike the screen; the rotating color wheel animates the display.

If the cardboard masks are positioned close to the plastic screen (say 3-4 inches) the patterns and shadows are sharply defined. In the preferred position, about 8-14 inches behind the screen, the images are "soft" and blend and weave and flow in a fascinating progression.

In another application, a Colorsound Translator is connected to the system. The Colorsound unit (selling for about \$ 175.00 in Hi Fi stores) is connected to a source of music, and "translates" the frequency and intensity of the music into three channels of output, which are connected to the three lamps. This enables the display to be tied in with the music. One, two, or three of the floods will be activated depending on the ratio of bass, mid-range, and treble instantaneously present in that passage of music. In a simplified modification, flashing Xmas tree lamps are substituted for the floodlamps and color wheel.

**ADVANTAGES** of Dr. Hill system- a fascinating display. Brilliant enough to be used in areas of fairly high level illumination. Novelty. Can easily be tied in with music. Flexible.

**LIMITATIONS:** The boxes are cumbersome to move and set up. They are somewhat fragile. Some persons report that they become bored after a few minutes of watching the same display repeating itself over and over. Does not readily lend itself to projection on a screen for larger images. Present largest display is about 6' wide, which appears inadequate for large audiences.

**MODIFICATION:** The equivalent circuit of the Dr. Hill effects can perhaps be more readily achieved by using a cluster of three slide projectors or filmstrip projectors, and superimposing their images on a screen. A small color wheel would run in front of the lens of each projector. Then by photographing masks or symbols and making high-contrast black and white slides, the identical effects could be projected for a larger audience.

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**"COLOR ORGANS"** These are complex color projectors; one, two, three, and up to seven separate lamps, each of which is triggered by a band of sound frequencies from tape, record, or live music, and result in the display of moving forms of color, and sometimes "hard" images. In one application, the "tru-focus" type projector lamps (Sylvania Electric type DFA) are focused through color filters onto slowly rotating turntables containing mirror elements consisting of fragments of broken automobile sealed-beam headlights, concave surfaces up. These sweeping patterns are then RE-focused by an array of objectives, usually made from old enlarger condensing lenses, or dime store magnifying glasses.

Instructions for building these instruments originally appeared in the December, 1960, issue of Science and Mechanics Magazine. We strongly recommend that you obtain a copy of this article in a back-issue magazine shop if you anticipate building a color organ. This was the "source" design for many of today's family of "color organ" instruments. The process is patented by Maurice E. Wetzel of Chicago, Illinois, and is called "Musicolor, Inc."

Refracting instruments (as opposed to reflecting modes) have been built by the author based on this system. A 10" diameter wheel of coarse screen, called "hardware cloth", and available at hardware stores, is rotated by a 2 rpm Bristol timing motor in front of four type DFA 150 watt lamps. Attached to this rotating wheel are 3" X 4" pieces of shower door glass and aluminum masks with holes and shapes cut in them, small glass lenses, etc. The rotating elements break up the light from the projection lamps into soft forms, which gently sweep across the screen. Color filters, red, green, blue, and violet are placed in 5" squares in front of the rotating wheel, so that the light from each lamp is one color only. The system is connected to a translator of my own design, so that the red lamp responds only to bass notes; green to mid-range, and blue channel only to the high (treble) frequencies of the music, which accompanies the performance.

These "color organs" are exciting displays, and far more pleasing than static applications. They result in an ever-changing flowing series of moving patterns, of high saturation, covering a screen area of approximately six feet across.

**ADVANTAGES OF COLOR ORGANS...** Sophisticated display, definite correlation between color, pattern, and music. High saturation. Non-repetitive.

**LIMITATIONS:** complex, expensive, relatively dim compared with other projection systems, medium attention span (not over 1/2 hour), not suitable for coverage of large areas or large audiences (over 200 persons) at this state of development.

**"THE CRYSTAL TRIP"** A highly sophisticated color display consisting of slowly ebbing and flowing color patterns of definite patterns, ever-changing, but of definite shapes that fade and blend into successive frames of crystalline structures. This is an outgrowth of the world-renowned "Auroratone" secret process of Cecil Stokes which was used with such fantastic success by the Veteran's Administration and mental hospitals during WW II. The apparatus consists of a specially modified dual projector (Bell & Howell Tandematic) to which extra motors have been added internally to drive polarizers, analizers, and optical retardation elements in the optical path. The images are created by thin molecular films of birefringent crystalline substances fused between 2 X 2" lantern slide cover glasses. A number of the glasses are heated on an electric plate, or an electric iron set to lowest heat, and chemical substances exhibiting circular polarization characteristics, such as Acetanilid, are melted and fused to the glass.

A second glass is then sandwiched on top of the "melt", and squeezed until a properly thin layer of the fused chemical is spread between the heated glasses. The assembly is then cooled, and examined under crossed-polarizing filters. The process is repeated until a number of these "plates" having the desired patterns and colors are obtained. They are then ground at the edges on a pocket carborundum stone so that the glass corners will not cut the slide changer magazines. The finished glass sandwich plates are then programmed into the Tandematic magazine.

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The "fade" motor of the projector is slowed down so that the fading cycle from one slide to the next covers 10 - 12 seconds, instead of the original 1 - 2 second cycle. This is done by adding a half wave silicon rectifier in series with the motor winding and the line, and bridging this with a 5000 ohm 10 watt wire-wound potentiometer. This provides a variable speed control for the fading function.

Circular retardation elements, cut as 2" squares of ordinary mylar plastic, are included in the optical train to bring out the brilliant colors latent in the polarized crystals. Finally, a polarizing filter is rotated over each lens at the speed of about 3 rpm to complete the system.

The colors and patterns are "organic", highly intriguing, and fascinating. The effect is one of wonder and relaxation. Musical accompaniment is critical; we prefer light classics such as side 1 of the Columbia Stereo Album MS 6575 entitled "Reverie".

Other chemicals giving excellent results are Cholesterol Acetate, Terpin Hydrate crystallized from Xylol solution, Sulpho-Methane crystallized from Canada Balsam (chinese characters), Asparagin crystallized from water solution, Trional in Xylol, Pilo Carpin deposited from ethyl alcohol (giant feathered plumes), Resorcinol heated. The process is disclosed in Stokes' U.S. patent no. 2,292,172 and Strong, no. 1,885,642, both of which are in public domain.

**ADVANTAGES OF CRYSTAL TRIP** .. A most beautiful, relaxing, and enchanting display. It is a "re-entry" effect and always calms and soothes an audience. Compact apparatus.

**LIMITATIONS:** . . Complex and expensive to duplicate (about \$ 500.00 for parts, not counting any time or labor or machine-shop work) Not as bright as overhead projection systems. Limited to audiences of about 400. Too subtle and sophisticated for younger crowds. Not compatible with "rock-and-roll" idiom.

"TRIP WITHOUT GLUE" is the name dubbed on a process using the identical projection apparatus as above, but using colored slide transparencies in the program instead of the transparent and invisible crystal plates.

In this color effect, a number of 35 mm slides were made on an optical printer by double exposure, burn-in, optical superimposition, etc., following the work of psychologist Carl Jung and his dream sequences. These are images such as a giant hand suspended above a world, eyes in the palms of two open hands superimposed over a sunset; non-objective art such as birds flying through complex maizes; unconscious phallic symbols such as triangles and spheres and arrows superimposed over Rohrschach type ink-bLOTS, etc.

In operation, about 54 of these are programmed into the fading magazines of the Tandematic. The polarizers are set rotating, and the overall color of the field goes through changes embracing the entire spectrum. As each slide appears, various portions of the image go through color changes, then gradually fade into similar but strange secondary images. The effect is quite profound. The images are a bit dim, and not feasible for audiences of over about 50, since so much light is lost in the polarizers and analizers and retardation elements necessary for the color effects.

**PROGRAMMED IMAGE SYSTEM** ... This was an outgrowth of the "Trip without Glue" machine combined with the Dr. Hill effects.

Three slide projectors or three filmstrip projectors (preferred) are equipped with individual rotating color wheels. One each, 3, 4, and 5 rpm. The magazines are then programmed with a sequence of simultaneous images and patterns shot on high contrast black and white film. Images are selected for their "turn-on" symbology. They are then precisely superimposed

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on the screen so as to overlap exactly. The lamps of each projector are connected to the electronic sound translator mentioned earlier, and the cooling fans and slide advance mechanisms are left connected directly to the 115 volt AC line.

Peculiar to this system is the fact that programs are set up as three separate elements, which are interrelated, so that when precisely superimposed, they form an organic whole. If any portion of any one of the three is disturbed, either by sound, or color from the color wheel, it has an interrelated effect on the image. After a few minutes, the effect becomes so totally absorbing, that it approximates the "turn-on" of psychedelic chemicals. No set of images remains on the screen for longer than four seconds. A "program" consists of over 300 such images, on three separate loops, which are changed simultaneously by a timing mechanism synchronized to three Graflex Compact projectors. (The smallest and brightest filmstrip projectors that we could find presently available.)

Sophisticated modifications of this system have resulted in several "spin-ins" on the part of stable and normal adults who have been exposed to the projections. These modifications consisted of pulsing one, two, or three of the projector lamps at the Alpha brain-wave rhythm, while the counterpoint was pulsed at the epileptic flicker rate, both of which are human physiological constants definable within narrow limits.

**ADVANTAGES OF PROGRAMMED IMAGE SYSTEM . .** This seems to most closely approximate the desired "trip" key-ins (Theta trap ?) than any other system we know of.

**LIMITATIONS:** . . Highly critical as to alignment and operation. Complex. Because of the several "spin-outs" we have had, we'd like to find out more about it before showing to an un-screened group.

**PROJECTION KALEIDOSCOPES . .** Although the patent office is full of similar devices dating back to the 1800's, we are greatly indebted to Mr. Richard Aldcroftt of New York who has built and reduced to practice the best instrument of its kind I have ever seen. It was called to my attention this July by Mr. Gerd Stern, who brought an Aldcroftt machine to the West Coast as an invitational presentation at the Berkeley Conference .

This device is an outgrowth of Mr. Aldcroftt's patent # 3,245,310 . It basically consists of a high-intensity collimated light source, a rotating series of some 60 odd elements as covered by patent, two 60° mirror elements (to produce a six-sided picture, which has been determined empirically to be most pleasing) and a single-element projection lens of about 7" focal length.

Kaleidoscopes produce a highly arresting series of ever-changing hard-form images, in both color and black and white. They are the most fascinating image forms I have seen to date, and capture the attention of everyone who sees them, including young children. I find that viewers do not become bored with Kaleidoscopic images, and they will bridge long periods of attention.

The images are somewhat "psychedelic" in that they strongly resemble the effects of DMT, and to a limited extent, LSD. There is no physical correlation with the music, however enough changes are happening all over the screen and this randomness gives the subjective impression that the image IS the music, and the music IS the image, regardless of the program selected.

**LIMITATIONS:** Practically none. System is compact, easy to handle and easy to set up. Light weight (10#). Improvements would be to substitute a 500 watt xenon arc for the source so as to cover a large screen. Present limitation is about a 10' diameter circle on a lenticular screen, or a 6' diameter on beaded or flat white surface. And there are only two such instruments in existence today that I am aware of. Plans are underway to manufacture these, since they appear to be a "breakthrough" in color instruments. Coupling to sound is not necessary.

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MOTION PICTURE SYSTEMS.. At several affairs such as the San Francisco "Acid Test" and "Trips Festival", loops of 8 and 16 mm motion picture film have been spliced end to end so as to run continuously and repeat the same six or eight foot sequence over and over. Photographic "no-seam" paper, 107" wide, or bed sheets, are hung above eye level, and used for screens. As many as 6 projectors are running simultaneously, (along with dozens of 35 mm slide projectors) and the effect is rather nightmarishly eerie. Loops or reels of subject material are usually selected for "nonsense" content. After a while, the repetition becomes hypnotic.

ADVANTAGE seems to be the fact that you can turn on a projector and let it run for long periods unattended. The effect created is sort of a confused, schizophrenic, "mad" nightmare.

LIMITATIONS Even with carbon arc projectors, there simply is not enough light from 16mm for effective coverage of large groups where there are any house lights on. 16mm projectors are relatively heavy, cumbersome, and expensive. The effects become boring after a short time. Not up to present day effects.

OVERHEAD PROJECTOR SYSTEMS (other than "wet" shows) These applications seem to be the best solution to psychedelic shows on limited budgets or where time does not allow setting up or constructing more elaborate systems.

Clusters of three overheads are arranged stage left, stage right, and center stage. A total of 9 projectors is preferred. One operator operates each group of three. Each projector should have a small color wheel consisting of a 3,4, and 5 rpm motor (it is important that each wheel have a different speed than the other two overheads at that station) rotating a cinemoid plastic color segment disc close to the underside of the lens. The color wheel should be attached so that it can be swung out of the way at times for straight black and white projection of moire' patterns, or used with the nesting concave "splash" bowls.

IN OPERATION, a single overhead would be used, no color filter wheel, by placing 11" X 14" high contrast black and white moire' patterns on the image stage, and slowly moving these mated pairs of images across one another. When projected on the dancers, the effects are unique. Transparencies of color gels, lacquers, and paste-on overlays can be used.

In another mode of operation, the output of one, two, or three projectors would be simultaneously superimposed on the same area of the paper screens, and the color wheels would be activated. Then the large blow-ups (11X14) of the patterns and other effects would simultaneously appear and flash in different colors on the screen. The color and intensity of each segment would be determined by its color wheel. Transparencies are manipulated by the operator or else they can be automatically rotated by motors, turntables, friction-roller drives, etc.

IMAGES: Sets of moire patterns are available from Edmund Scientific Co., Barrington, N.J. Prices are from \$ 8.50 to \$ 12.50 per set. Also catalogs from Op-Art showings, and various magazine op-art clips can be added to the collection. These can be assembled and taken to any shop specializing in making litho negatives for offset printers. For prices ranging from \$ 2.50 up, they will enlarge and photograph your patterns onto 8 X 10 film. The 8 X 10's exactly fit the standard cut-out mounts used with overheads. The first shot will be a NEGATIVE of your pattern. From this negative, the litho shop will contact print TWO positives, as the patterns must be used in pairs. And although the overhead projector will accept 10 X 10" transparencies, the extra inch on each side costs a premium price and is not necessary.

There should be at least a dozen SETS of patterns available for each projector for a full evening of "trip" light concert. Besides the moire' patterns, there should be groups of three images for the color projection image trip.

ALTERNATE SYSTEM for the "image" trip would be a number of automated 35 mm slide projectors,

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The preferred model is the Kodak Carousel, 500 watt, which has a circular magazine holding 80 slides. Slide projectors can be used as light sources for other reflected and refracted effects.

35 mm duplicate slide transparencies can be made for as little as .10 each, and special optical effects are simply executed. One limitation is that the 35 mm system cannot be adapted to moire effects, since the slide chamber is not easily accessible for sliding the second transparency across the first. Advantage to the 35 mm system are its compactness and ease of operation and semi-automated features. The 35 slide system puts out only a small fraction of the light available with the overhead projector system. Zoom lenses are generally used on the Carousels to adapt to different throws. Negative f.l. lenses are attached to overhead objectives to lengthen image throw for longer distances.

Sophistication of either of the above systems is to re-wire the projectors so that the lamp filament is independently brought out to a dimmer control, such as the Hunt Duo-Trol (which is a silicon symmetrical switch instead of the half-wave silicon controlled rectifier). The projector motor, changer, and fan MUST be left connected to the line, the whole system can NOT be simply tied to the dimmer, as the cooling fan and changer will not function.

**OTHER EFFECTS:** By placing a large sheet of polarizing filter material on the stage of the overhead projector, and then attaching a second polarizing filter or polarizing "spinner" (about \$ 80.00 list price for the spinner, and \$ 14.00 for the large filter) you have a system that will bring out birefringent colors in such materials as cellophane and laundry bag plastics. Then by manipulating such materials over the stage, there is a color display on the screen. Stressing, stretching, tearing, folding the plastic results in moving color images. This is the type of show performed locally and in Chicago by Mr. Del Close.

**STROBE LIGHTS** are becoming available for rental in the L.A. area. The little General Radio "Strobotac" units are very low powered and unsatisfactory more than three feet away. At "trips", they are simply used to drive (trigger) higher powered units. An alternate solution is to rent a stage spotlight, such as the "Trouper" model, and equip it with a hand driven or motor driven shutter wheel. As this segment-type shutter spins in front of the spot, it chops the light and gives a very high intensity system that can be directed over long distances. Called "Lobster Lights", they only approximate the effects of a true "strobe."

**MIRRORED BALLS**, similar to the old ballroom installations, are occasionally set up at "trips". These are hit by several tight beam spotlights and cast a rapidly rotating series of little spots all around the audience. Mount the balls OFF CENTER of the area for optimum effect.

**BLACK LIGHT** or Ultra Violet is generally used at all-out festivals. Sometimes a number of high-intensity sources are placed around the auditorium. Fluorescent spray cans of colored paints, UV pigments, and UV excited chalks in assorted colors are passed around. Symbols are painted on foreheads, hands, clothing, etc. These are invisible until excited by the black lights. Sometimes large war-surplus weather balloons are sprayed with UV phosphors and inflated and bounced around as toys. Usually the band and dancers have special UV fabrics in their attire.

**JUNK ART**, collages, constructions, mobiles hung so as to cast color shadows from multiple sources, etc., are usually a side issue at trips.

**ELECTRONIC SOUNDS...** During intermissions, breaks, set-up times, and as bridges, the standard procedure seems to be to blast the audience with squeals, white noise, "space" sounds, electronic music, etc., from records or tapes from backstage.

And MANY OTHER color, sound, and light effects have been used and will be discovered. This is a brief outline summary of some of the existing devices as of December, 1967.

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ESSENTIALS . . When buying or renting projection equipment, OBSERVE THESE RULES . .

FOR maximum light intensity and coverage we recommend only the use of the NEWER generation of overhead projectors, such as the "Travelgraph Model 21000 RX" or equivalent. The unit MUST be specified to use quartz-iodine or quartz-bromine lamps, never the older and now obsolete standard incandescent lamps. A 600 watt Quartz Iodine projector puts out considerably more illumination than the older 1000 watt and 1200 watt incandescent models.

The salesmen are still trying to unload (both sales and rental) the outmoded models. Don't bite.

Specify that your projector have the plastic Fresnel (pronounced "fra'nell") condensing lens instead of the older glass condensers. The newer units are half the weight and twice the brightness of the projectors sold as recently as a year ago. American Optical Co., 3-M Co., Besseler, Travelgraph, etc, all make these light-weight units.

Specify CORNER POST lens support, and do not accept a CENTER POST projector as a gift.

Specify that a spare bulb be included in rental deals; and purchase a spare for your own projector. Store it INSIDE the unit. Replacement lamps, such as the typical "FCB", cost about \$ 8.00, and when one burns out, you are disabled unless your replacement is handy. These newer lamps are NOT a corner drugstore item. Life expectancy averages ten hours minimum to 75 hours maximum. We run ours on dimmer controls at about 10% under-voltage, and haven't replaced a bulb in hundreds of hours.



Purchase of good overhead projectors runs from about \$ 150.00 wholesale to over \$ 450.00 list. (depending on model). Dealers are listed under "Audio-Visual Equipment & Supplies" in yellow pages. Rentals run from \$ 10.00 per night, based on one night charges, to \$ 13.00 average, up to \$ 15.00 maximum. Camera Craft in Hollywood has A.O. Apollo overhead projectors for the low price of \$ 10.00 per night.

Better units have well designed forced air cooling and thermal switches that keep the fan running after the lamp is turned off until the lamp housing and condenser are cool. PERSONNEL SHOULD BE CAUTIONED NEVER TO TURN ANY PROJECTOR ALL THE WAY "OFF" OR NEVER TO DISCONNECT THE LINE PLUG UNTIL COOLING FANS HAVE RUN FOR AT LEAST A MINUTE AFTER THE LAMP IS TURNED OFF. This applies to ALL projectors, slide, movie, overhead, etc.

All newer projectors are equipped with the 3-prong plug to comply with county ordinances and underwriter's rules. But the outlets and junction boxes you will generally find will not accept these 3-wire grounded systems. So be sure to purchase or borrow an adaptor plug for each unit, and TAPE this to your projector plug so it will always be a part of the system. Without it, you are out of business.

SLIDE PROJECTORS . . The Kodak Carousel 500 watt model is the almost universal choice today.

FILMSTRIP PROJECTORS . . My personal choice is the Graflex "Compact" model, which is by far the most portable, convenient, handy, light-weight, and brilliant (for its 150 watt lamp) that I have found. These coat-pocket size wonders will easily pack 6 to an attache' case for traveling. They are available with automatic remote control film advance for about \$ 65.00 wholesale. Different focal length lenses are available, 2", 3", up to 5". These Graflex Compacts are the heart of our lecture show and programmed image presentation.

For multiple projection with overheads, be sure your line is fused for a minimum of 25 amps. And NEVER move or jar any projector when the lamp is "on". The filament may break.

BIBLIOGRAPHY of useful "how-To" articles and specific information on Light Machines,  
Color Organs, Electronic Circuits, and Psychedelic Happenings . . . .

May 1953 Industrial Laboratories "Science Expands Art Horizons" Description of Mobile Light Display by Charles E. Singletary.

July 3, 1959 American Banker Another description of Singletary's "Celestial Color" device.

\* Dec. 1960 Science and Mechanics Magazine "Play Moving Color Tunes with Your Records" Original article describing construction of M. Wetzel's "Musicolor" organ.

Oct. 1961 Audio & Record Review "Sound in Color" Donald Aldous. British firm Bonochord describes original Colorsound unit for home hi-fi installations.

May 1962 Electronics World "Transistorized Photorhythmicon" Leon Wortman. A 3-channel freq. divider driving power transistors for low voltage system

Aug. 1962 Electronics World "High Powered Transistorized Photorhythmicon" Wortman. A novel semiconductor color organ, 3-channel, pwr. transistors and lo voltage lamps.

Jan. 1963 Journal of the Audio Engineering Society "The Sound of Sound and Light" E.R. Hanson. Technical details of 10-track tape and light dimming system.

Mar. & Apr. 1963 AUDIO "A Wall-Projection Color Organ" Morris Dollens. Circuits and construction plans of thyratron-controlled projection color organ. Unique.

Apr. 1963 Electronics World "Solid State 3-Channel Color Organ" Donald Lancaster. A 3-channel inductance freq. divider circuit using unijunction and SCRs. Expensive.

May 1963 Scientific American "Moire Patterns" Gerald Oster and Yasunori Nishijima.

Jan. 1964 Electronics World "Simplified Solid-State Color Organ" Donald Lancaster. Economical version of Apr. '63 ckt. Simple filter system with SCRs, 375 W/channel.

Aug. 1964 Mechanics Illustrated "Build a Hypnotizing Harmonograph" Keith A. Gourlay. Construction details on mechanical apparatus which draws fantastic patterns automatically by a pendulum system of weights.

Aug. 1964 The Psychedelic Experience Timothy Leary, Ralph Metzner, Richard Alpert. University Books. The original manual based on Tibetan Book of the Dead.

July 1964 Electronics World "Transistor-Photocell Color Organ" Fred Blechman. Simple circuit in which pwr. transistors drive # 47 pilot lamps which excite CdS cells.

Nov. 1964 Popular Electronics "Electronic Candles Dance and Glow" Jeff Taylor. Circuit for pulsing incandescent lamps with SCRs and neon relaxation oscillators.

Dec. 1964 Popular Electronics "Christmas Lights Twinkle to Music" Leon Wortman. High pwr. Rhythmicon circuit in which SCRs are triggered by audio and unijunction. 450 W. max.

Jan. 1965 Popular Mechanics "Rear Projection Screen Cabinet" Manly Banister. Ingenious system for folding optical path with mirrors to construct compact rear-projection box.

Jan. 1964 Popular Electronics "Self-Regulating Lighting Controller" Novel SCR circuit for automatically sensing light level and holding it constant.

Feb. 1964 Audiofan "First Sound-to-Color Translator for Home Use" Complete published circuit and technical description of COLOR SOUND Translator model 201.

Mar. 1965 Popular Electronics "Low Cost Hi-Fi Color Organ" Donald Lancaster. 3-lamp display that follows sound. CdS cells in series with 25 watt lamps.

May 1965 Popular Electronics "The Dymwatt" Don Lancaster. Inexpensive Triac lamp dimmer.

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Bibliography, continued.....

Sept. 1965 Popular Electronics "Spookin Light" Jeff H. Taylor. Novel lighting effects achieved by modulating an SCR light dimmer at an audio rate.

\* Oct. 1965 Radio and Electronics "Build This New Hig-Power Colorgan" Donald Lancaster. 400 watt/channel, 3-channel SCR system with good filters. Excellent circuit.

March 25, 1966 LIFE Magazine, "LSD Issue." Article by Albert Rosenfeld, pg. 28ff.

No.7/1966 PSYCHEDELIC REVIEW . Article on Moire Patterns and Visual Hallucinations, by Gerald Oster.

May 27, 1966 LIFE Article "Wild New Flashy Bedlam of the Discotheque" Several excellent photos of N.Y. and West Coast color and light "scenes".

\* June 28, 1966 LOOK "Where the California Game is Taking Us" George B. Leonard.

\* July 1966 Popular Electronics "Build the Musette" Donald Lancaster. A five channel SCR Color Translator of excellent design, 150 watts/channel. About \$ 80.00 for parts. This is the most advanced and satisfactory circuit that we have seen.

1966 "LSD" 130 page soft-cover book published by The New American Library. Richard Alpert, Ph.D., Sidney Cohen, M.D., and photos by Lawrence Schiller.

\* Sept. 9, 1966 LIFE ; Article "LSD Art," pp 60-69. Extensive coverage & photos of Light scene.

1967 YOUTH QUAKE Special report by Cowles Publ., U.P.I., and LOOK magazine.

\* AN INTRODUCTION TO THE AMERICAN UNDERGROUND FILM by Sheldon Renan. E.P. Dutton & Co., N.Y. 1967 Excellent treatment of light shows in final chapter.

\* LIGHT SHOW MANUAL by Bob Beck. Expanded edition, paperback, with extensive photo illustrations, to be published in March, 1968 by Pacific Publishers.

\* Items marked with asterisk are prime articles of greatest usefulness.

In addition to references cited in this condensed bibliography, we have in our files dozens of other background and editorial clippings on color games, electronic music, light instruments, psychological systems of "psychopenetration", subliminal communication, etc.

We have facilities to make thermofax copies of any of this material for .25 per page.

Researchers are invited to query us on any of these games.

Over 200 patents relating to color instruments, sound translators, light organs, etc., are in our files in the form of 35 mm microfilm. Copies can be optically printed at a cost of 50¢ per 35 mm microfilm foot (8 pages).

We also have color filmstrips and 35 mm color slides showing historical and current color games such as color healing, chromotherapy, mystical uses of color, aurora borealis, astronomical color wonders, Cecil Stokes and his Auroratone process, and many related fields. Slides are 35¢ each, filmstrips on rental or exchange basis. Our laboratory can prepare images in any size for projection from your material or from ours.

We look forward to exchanging data with other "color heads" seriously involved in this game . .

bob beck  
1538 Cassil Place  
Los Angeles, California 90028  
(213) 463 8901

## WHERE TO GET THINGS •••••••••

Electric drive motors, pulleys, bead-chain, switches, etc...

Minarek Electric Co., 224 EAST 3rd st., Los Angeles, 624-3161  
(Fractional hp Bristol timing motors for color wheels and mirror turntables, under \$ 5.00)

Optics, lenses, polarizing filters (small), surplus electronics, almost everything . . .

C. & H. Sales Co. 2176 East Colorado Blvd., Pasadena, Calif.  
Edmund Scientific Co., Barrington, N.J. (Millions of optics, Moire' patterns, etc.)

Color filters, lamps, rental lights, mirror balls, theatrical effects, etc.

Olesen Company, 1535 Ivar Ave., Hollywood, Calif. 90028 465-5194  
(Specify PLASTIC color filters, such as Cinemoid, never the older, fragile "geletins")

Black light units, sales and rental; Ultra Violet paints, pigments, materials, etc....

Shannon Luminous Materials Co., 7356 Santa Monica Blvd., Hollywood 876-2660  
Ultra Violet Products Co., 5114 Walnut Grove, San Gabriel; 283-3193

Lighting rentals, spotlights, special effects, carbon arc lights, etc.,

Bill Hilchey Enterprises; 1127 North La Brea Ave., Hollywood 464-7488

Overhead projector sales and rentals; 35 mm and filmstrip projectors, etc.

Amertron Rents; 567 So. Fairfax Ave., 936-8271  
A.F. Milliron Co., 1198 So. La Brea Ave., L.A. 937-2722  
Camera Craft Audio Visual Sales, 6820 W. Sunset Blvd., Hollywood 463-6856  
Ralke & Co., 641 No. Highland Ave., L.A. 933-7111  
Coast Visual Education Co., 5620 Hollywood Blvd., L.A. 90028 466-1651  
Photo and Sound Co., 5515 Sunset Blvd., L.A. 28, 466-7681

Chemicals, bottles, supplies, solvents, etc.

The Wholesale Supply Co., 1005 Lillian Way, Hollywood 467-4194

Large sheets of Polarizing Filter material, 12" X 12" Bausch & Lomb catalog 31-52-62-28

Van Waters & Rogers, Inc. 1363 So. Bonnie Beach Place., 269-9311 (\$ 14.00/sheet)

Front surface mirrors

Keim Precision Mirrors Corp. 1346 E. Colorado, Glendale, Calif. 245-2725

Glass slide covers (Specify E. Leitz only) \$ 1.75 for box of 100

Mel Pierce Camera Store, 6051 Hollywood Blvd., Hollywood 28 465-3311

High-intensity Xenon Arc lamps, special illuminators, Leitz optics, etc.,

Los Angeles Scientific Instrument Co., 2451 Riverside Drive., L.A. 662-2128

Color slides, duplicates, prepared Moire' patterns, 8X10" overhead projector slides, etc.

Color Control Co., 1538 Cassil Place., L.A. 90028 463-8901

Plastic sheets, rods, tubes, bar stock, cylinders, supplies, sheets of translucent screen material-

Cadillac Plastic Co. of Calif. 2305 West Beverly Blvd., L.A. 385-3001

Rolls of white "no-seam" photographic background paper for hanging screens . .

Bob Gamble Photo Supply . . 5170 Santa Monica Blvd., L.A. . . 663-9251

# 13 Light Shows

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WHERE TO GET IT list, continued... ( A partial listing of people involved in Color and Light. If YOU are actively engaged with products or services related to Light Shows, communicate with us for a free listing in the next publication.)

## PEOPLE who give color concerts, conduct light shows, etc ..

### New York Area:

Gerd Stern, USCo . . 21 Church Street, Garnerville, N.Y. 10923 . .  
Jackie Cassen - Rudi Stern . . 727 6th Ave., N.Y.C. 10010 phone (212) 929 0262

### San Francisco Area:

Ben Van Meter . . 2255 Sutter Street . . San Francisco, Calif. (415) Fillmore 66491  
Robert E. Cohen . . Lumiere-I Corp. San Francisco . . (415) 346 4690  
Headlights . . Glenn McKay . . 1330 Divisadero . . San Francisco, Calif. . (415) 346 8883

### Los Angeles Area:

Bob Beck . . Light Associates . . 1538 Cassil Pl., L.A., Calif. 90028 (213) 463 8901  
Jim Morrissett . . Color/Light/Sound . . 1554 Cassil Pl., L.A. 90028 (213) 461 2153  
Jim O'Connor . . Omega's Eye . . c/o Genesis IX, 7551 Sunset Blvd., L.A. 90046 or 449 2714  
Dr. Henry Hill . . 512 No. La Brea Ave., L.A. (213) WE 55713  
Dennis R. Wier . . 3505 Pacific Ave., Venice, Calif. . (213) 763 9486

## THE MAN for electronic music, experimental sound tracks, film scores, music to order ..

Paul H. Beaver, Jr. . Elektron =Muzi C<sup>s</sup> . . 2825 Hyans St., L.A. (213) 382 4764 or 462 3311

## COLOR ORGANS, lighting apparatus, instruments for home and concert use ..

Bob Beck . . Light Associates . . 1538 Cassil Pl., L.A., Calif 90028 (213) 463 8901  
Jim Morrissett . . Color/Light/Sound . . 1554 Cassil Pl., L.A. 90028 (213) 461 2153  
Dr. Henry Hill . . (Artist, slides, light-boxes) . . 512 No. LaBrea Ave., L.A., Calif. WE 55713  
Robert Moore Williams . . P.O. Box 611 . . Valley Center, Calif. (714) 746 5636  
Royal O'Reilley . . (Inventor of original Colorsound unit) Royal Research, Inc. 2020 No. Chico Ave., So. El Monte, Calif. 91733 (213) 442 5230 (Excellent custom-built translators.)  
Celestro-Lite division of Celestron Associates . . 4 Broadway, Valhalla, N.Y. 10532  
Castle Lighting . . 2858 So. Robertson Blvd., L.A., Calif 90034 (213) VE 61311  
B & B Electronic Products . . 2120 South Platte River Dr., Denver, Colo. 80223 (303) 722 3035  
Stan Sohler . . "Spectra Flow" box . . 303 E St., Encinitas, Calif. 92024

## MOTION PICTURE shooting capability, our studio or location/set "psychedelic" lighting & effects

Light Associates . . Bob Beck . . 1538 Cassil Pl., L.A. 90028 (213) 463 8901  
Colorodynamics . . Hardin Walsh . . 2528 West 7th St., L.A. 90057 (213) DU 9 7111  
Color/Light/Sound . . Jim Morrissett . . 1554 Cassil Pl., L.A. 90028 (213) 461 2153

## PROJECTION APPARATUS, High-powered professional film & slide units, Xenon arc, Screens, etc.

Background Engineers . . Bill Tillisch . . 729 Seward St., Hollywood, Calif. (213) 465 4161  
(Rental/lease/installation/operation of professional super-powerful, long-throw, arc, etc., apparatus for stage shows, ice shows, rear-projection systems, etc. Excellent source.)

## SETS OF "PSYCHEDELIC" COLOR SLIDES, Moire Patterns for Overhead projectors, Film Loops

Light Associates . . Bob Beck . . 1538 Cassil Pl., L.A., Calif 90028. SLIDES, .25¢ each, complete set of 162 (to fill TWO Carousel trays) \$ 40.00 postpaid. 11X14 or circular high-contrast matched Moire' patterns, on heat-resistant Mylar film for manual or automated overhead projection systems, \$ 7.50 per set of two. 8 mm and 16 mm films and loops; quotation. Color/Light/Sound . . Jim Morrissett... Top-quality matched Moire patterns, color wheels, motorized/automated "Concert" projectors with electronic dimmers; light-show supplies. Dealer in Carousel projectors, Overhead projectors, Super-8 mm film, show installations. (Jim designed and installed the West Coast "Cheetah" club, and many other "environments.")

## STROBE LIGHTS . . Professional quality repeating flash units available from Bob Beck.

PATENTS directly related to Light Machines, Color Organs, Projection Kaleidoscopes, Polarizing Projectors, and sound-to-light Translators . . .

Great Britain 24,814 A. Wallace Rimington Color Projection Organ. The first! 1893  
 " " May 3, 1893 W.S. Simpson Liquid Kaleidoscope.  
 " " 8,909 Raphael, R.O. "  
 " " 174,747. 1922 A.B. Klein Color Projection apparatus.  
 " " 227,072 1924 C.F. Smith Mutichrome. (Multiple lens special effects machine.)  
 " " 235,994 8/19/1925 Raphael, R.O.  
 " " 377,784 8/4/1932  
 " " 399,521 9/29/1933  
 " " 428,399 5/13/1935 Midgley. Control system for illuminating apparatus associated with musical instruments & producing spectacular effects. Compton organ.

FRANCE 27,746 April, 1924

GERMANY 434,763 3/31/1925 Hans Oder  
 " 533,765 2/4/1930 Otto Bavel

UNITED STATES PATENTS :

147,480 Collicott Feb. 17, 1874  
 151,005 Bush May 19, 1874  
 163,173 Ferris, et al May 11, 1875  
 1,323,943 C.F. Wilcox 12/2/1919 Method for producing musical compositions through the medium of color.

1,345,158 M.H. Greenwalt 1920 Illuminating means. (First of the Greenwalt color organ patents.)  
 1,357,773 " "  
 1,385,944 1921  
 1,401,608 B.G. Kingsley 12/27/1921 Illuminating attachment for keyboard musical instruments.  
 1,406,663 Richard Lovstrom 2/14/1922 Projection color organ. (Kaleidoscope and others.)  
 1,432,552 A.B. Hector 10/17/1922 Production of color music & other luminous effects, apparatus.  
 1,432,553 " " "  
 1,454,691 Ridell et al 5/8/1923  
 1,449,122 Marchand 3/20/1923  
 1,481,132 Greenwalt 12/20/1927 Reissue # 16,828  
 1,505,151 Kunschman 8/19/1924  
 1,549,778 R. Lovstrom 8/18/1925 Light projection display.  
 1,654,068 D.G. Blattner 12/27/1927 Apparatus for visual interpretation of speech and music.  
 1,662,743 Hannon 3/13/1928  
 1,654,875 (1928) Means for controlling light.

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### PATENTS, continued

1,690,279 E.B. Craft 11/6/1928 Apparatus for visual interpretation of speech and music.

1,690,602 Trivelli 11/6/1928

1,712,431 Hadley 5/7/1929

1,717,785 F.J. Kaehni 6/18/1929 Method & means for producing illumination effects.

1,718,499 Marguerite C. Thomas 6/25/1929 Color design display contrivance.

1,728,860 A.B. Hector 9/17/1929 Producing color music & other spectacular effects.

1,749,011 Thomas Wilfred 3/4/1930 Light projection display. (First of the "Clavilux" patents.)

1,758,589 " " 5/13/1930 " " "

1,780,969 Brunner 11/11/1930

1,825,497 Thomas Wilfred 9/29/1931 Light projection display apparatus.

1,885,642 Strong 11/1/1932 Polarized crystal display projector anticipating Cecil Stokes' patent.

1,891,216 Clinton W. Hough 12/13/1932 System for projecting light in variant colors. A very complex keyboard-operated color organ.

1,914,562 Freeland 6/30/1933 Kaleidoscopic system. Excellent!

1,937,454 Thomas Wilfred 9/11/1934 Light display apparatus.

1,977,997 E.B. Patterson 10/23/1934 Light and motion apparatus.

1,990,867 Harvey 2/12/1935

2,018,214 E.H. Land 10/22/1935 Advertising display device. Colors by polarization.

2,038,909 Smith et al 4/28/1936

2,099,872 A high-intensity projection system using rotating mirrors for scanning. Harmonograph.

2,099,904 Pennington 11/23/1937 Good

2,131,934 R.D. Burchfield 10/4/1938 Visual interpretation of electrical currents. (CI 84-464)

2,152,424 Wetmore 3/28/1939

2,184,138 Corey 12/19/1939 Polarizing system.

2,216,260 Maurice Wetzel 10/1/1940 Decorative lighting apparatus. Basic to "color organs".

2,275,283 R.D. Burchfield 3/3/1942 Visual interpretation of electrical current.

2,292,172 Cecil A. Stokes 8/4/1942 Process & apparatus for producing musical rhythm in color. The original "Auroratone" patent!

2,297,767 Hunt 10/6/1942 Good.

2,307,202 Eddy 1/5/1943

2,329,112 Eddy 9/7/1943 Excellent.

2,423,371 Carranza 7/ 1947 Polartoscope

2,475,930 Wesley 7/12/1949

2,553,005 Regan 5/15/1951

2,677,297 Maurice S. Wetzel 5/4/1954 Rhythmic decorative lighting apparatus. (CI. 84-464)  
This is the prime patent of all reflective color organ systems.

PATENTS, continued  
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2,727,426 12/1955

2,757,570 Molner 8/1956

2,868,055 A. Simos 1/13/1959

3,038,061 Royal V. O'Reilly 6/5/1962 Apparatus for translating sound into correlated physical effects. (CI 240-3.1) This was the original vacuum tube and thyratron "Colorsound" translator.

3,245,310 Richard Aldcroft 4/12/1966 Describes the internal mechanism of the original model of the projector imaging system on which today's preferred light instrument is based.

Copies of any of the above are available from the U.S. Commissioner of Patents, Washington 25, D.C. for .50 per copy. We have 35 mm microfilm copies of all of the above, available for .50 per 35 mm foot. Each foot contains eight pages of material. Patents vary from three or four pages to 30 pages and over. Patents are the most useful source of technical background information and construction details on light instruments in existence.

We were amazed to find that nearly all of today's instruments had their initial disclosures in the 1800's, and the most complex reductions to practice were in the 1920's and 1930's. Modernizations have not been made in the optical and mechanical systems; only in the electrical and lamp technology. The advent of Xenon arc and quartz-iodine (quartz-bromine) are the most significant advances in lamps; and the advent of silicon controlled rectifiers, silicon symmetrical switches ("Triacs") and power transistors are the modern-day equivalent of the older and inefficient power rheostats used to control light intensity before the mid 1950's.

The maximum life of a valid U.S. patent is fourteen years. An item is non-patentable if it has at any time been described in the literature; if it has been "revealed" prior to patenting; if it has been patented previously; if diligence has not been pursued in its protection; and (recently) if the principle would be obvious to one versed in the state of the art, even if original.

All patents prior to fourteen years from present time are expired and in "public domain".

In addition to the 69 references cited above, a list of over 200 additional patent numbers relating to color and light machines was recently uncovered. I have not had time to date to personally search them for applicability.

## THE LIVE PERFORMANCE . . . Comments by Jean Mayo

Though color "machines" are fun to watch, light in motion does not truly become an art form until the artist himself controls the space and time of colored light. If the music is a live performance, the artist and musicians build emotional images interrelatedly. Lights should contribute to the dissolution of the space frame of the entire environment of the audience; that is, the horizontal and vertical surfaces are broken up by the lights and the concept of spatial distances is deliberately made confusing. This helps the ego to let go and float freely, which is the artist's goal.

There are many ways to plan color events so that performances fit into a preconceived time pattern but still allow spontaneous interactions of music and lights to "channel" through and create a living form of its own.

## I. Dancers:

## a. Rear projection.

1. Use three spots with gelatines of the three primary colors of light- red, green, blue. When the lights are balanced, each dancer casts seven shadows- primary colors, secondary colors, and black. By changing their positions relative to the lights, the dancers change size and create non-figurative designs by working with the colored spaces between them. If the lights are also in motion, the variety of mood, design, and motion is endless. To move the lights and vary their intensity requires a closely knit crew, or a control panel of dimmers such as operated by Micheal Shere at the Experiential Theatre performance at the Troubadour in Los Angeles.

## b. Front lights.

1. If the dancers are in front of a white screen, the primary spots used in front can be effective, especially if they are widely separated to spread the shadows. Many variations are used.

## 2. Ultra violet and strobe lights.

A fascinating variation is to place the dancers in front of a shredded plastic drop cloth, having parts of their costumes and parts of the drop painted in an "op art" design with flourescent paint. The dark of the strobe cycle will create a different design from the flash because the U.V. remains on continuously.

## II. Split image projection.

a. Remove the lens from a slide projector, so it can be hand-held in front of the projector and easily moved around. It should be possible to load slides in the projector in line but a small distance apart. By moving the lens back and forth, one slide will dissolve into the other, as the focus shifts. Faces can appear out of abstract images, or oceans can become deserts, etc. This method has hardly been explored. As an aide to individually programmed therapy sessions, it could be quite effective. Photographs from a person's childhood could be introduced within the moving inkblot images to trigger memories of ancient repressions.

b. Three dimensional shadows of objects in motion in front of the projector direct the light in an endless progression of patterns over a large area. With the lens removed, designs are not limited to the rectangle of the single-image projector. Combining a series of projectors and a control panel, or having them individually operated by a team that is "tuned in" could create a total environment of blended and overlapping patterns.

Just as Vortex Sounds, performed in San Francisco's Hayden Planetarium in 1959 by Sandy Jacobs could travel around the room from speaker to speaker, so light images could follow such sound from one projector to another.

The ultimate non-chemical psychedelic light and sound performance has yet to be produced. But one can envision orthophonic sound and matching lights all operated by a non-competitive crew lovingly attuned to each other, the audience, and the cosmic consciousness. When evolutionary processes allow us to cooperate in these ways, the new-age cathedral will be born. The architecture will have the spherical dome ceiling of a planetarium. Perhaps it will be a Buckmeister Fuller geodesic dome, which Dick Alpert called an "Om Dome".

This would truly be a temple to man's creative spirit, his loving nature, and to that within him which is infinite.

## COLOR GAME TRAPS . . . by Dr. Henry Hill

The color game is as rewarding and satisfying a hang-up as you could ever hope for. As a plus value, there exists today a vast untapped commercial market for color and light instruments. There lurk, however, several traps, both internal and external into which the novice color enthusiast can fall, and these traps are hidden from conscious view because they relate to the deep and lasting psychological impact of color and light.

Whether you play this game for love or money, be forewarned as to the psychological pitfalls that most certainly await you should you ever get off the ground.

Dynamic, ever-changing color is more than beautiful and stirring. It can be psychological dynamite. It reacts not only on the conscious mind of the beholder, but on deep unconscious levels as well. Many persons shut off from their unconscious motivational energies are highly disturbed by color effects. Schizophrenics, particularly, have been found to be "threatened" by any intrusion into their defense mechanisms. And color interacts deeply and emotionally.

To the creative person, who is likely to be in better communication with his own unconscious, the impact of moving color poses little threat. He can "have" this art-form comfortably. To more rigid, non-creative people, particularly those who are imitative and exploitative or "second handers", the syndrome is quite different. The imitative-exploitive character structure is one in which there is generally a strong, hyper-masculine ego image which must be protected against all foes, real or imaginary. The greatest single threat to this ego image is the power of womanhood; in short, the power of mother. On some obscure unconscious symbolic level, dynamic moving color represents this very power, and is the softness and beauty and acceptance that the imitative-exploitive character regards as a hunger, defect, or threat living within himself which must be destroyed.

His method of destruction is to spoil or alter, and anyone who plays the color game will eventually be the target of many persons who unconsciously seek to null the game. The spoiler is an ever-present threat, and it is time and energy saving for you if his identity and tactics be recognized.

There are two major roles in which the spoiler masquerades. We call them (1) the "PROMOTER" and (2) the "ICDIB", a name derived from the phrase "I Can Do It Better!" These two spoilers are to be separated from other well-meaning people, such as the "Why don't you?"s or the stranger who runs up to you after a performance and compulsively grabs you and starts telling you all about some OTHER color machine he has seen or heard about, or some other friend of his who knows a man who knows all about this, etc., etc. (This is his defense against admitting that he has had a new experience or a new emotional reaction with which he cannot comfortably cope or categorize.)

The "promoters" and "ICDIB"s are covertly destructive and suppressive in their unconscious intent and actions.

The "PROMOTER" is a person who has been exposed to color and instantly "intends" to use color in some commercial venture immediately. Perhaps it is for background effects in bars, homes, restaurants; or sometimes he grabs the idea for a show or performance, or he envisions a new-age color temple. While on the conscious level his intentions appear good and noble, he is unwittingly playing a deadly game with himself and anyone else he involves. His behavior is amazingly predictable, but nonetheless dangerous, and once his game is begun, he must compulsively carry it through to the bitter end. Even though he has a history of integrity and awareness, once he begins to play the role of "color promoter", all past rules collapse. THERE IS SOME SUBLIMINAL FACTOR IN DYNAMIC, MOVING COLOR THAT BRINGS OUT DESTRUCTIVENESS IN THE NON-CREATIVE PERSON WHO ATTEMPTS TO EXPLOIT IT COMMERCIALLY.

His tactics run as follows: (1) He opens by making great promises and building you up (2) he steals a great deal of your time and systematically picks your brain and ideas, (3) he begins to subtly find fault with your devices and with the whole idea of color, (4) when confronted directly on the issue of finances, he stalls at first and later diverts the real issues by endless quibbling over pennies when at first he had been talking about dollars, (5) he progressively finds more and more fault with you (this is a process whereby you have become the victim of his own projections and basic insecurities) and finally, (6) he aborts the game by completely negating and abandoning the

dynamic use of color, or by hiring someone other than yourself to install the color in a greatly reduced, devitalized, emasculated and insipid application which must always be a washout.

The psychological model of the "promoter" is a half-man desperately trying to hold together a crumbling self-image and threatened ego.

No matter how promising and businesslike your initial meetings with the "color promoter" may be, in time contact becomes a frantic, ridiculous farce where you are progressively victimized. The "color promoter", no matter how polite on the surface, unconsciously views you as the hated and feared mother image, and attempts to suck you dry. He sucks out your ideas, he sucks dry your time, when he can he sucks dry your money, and most deadly- he sucks dry your creativity, aspirations, and enthusiasm. He can be equated to a "feeding problem" infant who sucks, regurgitates, only to immediately cry and suck again. Ultimately, if weaned from you, his destructiveness is turned back onto himself, and he sucks dry his own project leaving it in a state of devastation or at best in a state of impotent banality where everything dynamic or creative within it has been obliterated.

If you play the color game, you are destined to be confronted with many color promoters. There are ways of handling this, and one is that you should ask for a substantial advance payment of "front" money at the very first interview. Or force him to clearly state his exact budget for the operation, and then submit a written proposal of what you can deliver for that price. Then see that he puts exactly that amount, not a penny less, in escrow or with a third party until the job is completed. Otherwise he will **ALWAYS** change his mind again and again. Losing your temper does no good, you are dealing with a sick person, not a normal businessman.

Only by thus insulating him from his "death wish" and "accident prone" behaviour, can you ever hope to satisfactorily complete any project with a color promoter. If he refuses to come up with any money in the first 48 hours, he is certain to follow the downward spiral outlined above. And the sooner you can rid yourself of his time-consuming evasions, the more pro-survival it will be for you. Do not be lured by promises of great money and big deals in the future, these are paranoid fantasies. This is a predictable certainty! Disconnect immediately. Remember the old story about the Chinaman who cut his dog's tail off an inch at a time so it wouldn't hurt so bad! Dragging "the honeymoon" out will never produce anything of value in the real universe.

#### THE "ICDIB"

The "I can do it better" person is the major advisory of those of us who want to build color devices and light instruments as an art form or on the amateur-hobby level. While he is perhaps less of a hang-up than the self-deluded "color promoter", he is nonetheless a destructive and diversionary force who will thwart your efforts if you let him.

The typical ICDIB is a person with some degree of knowhow and skill, usually in the fields of electronics, optics, photography, or color. He has clipped articles in technical magazines describing "color organs", "colorsound translators", and similar devices having to do with light effects. He has probably examined quite carefully various colored light effects, such as signs in beer bars, and secretly considers himself to be an authority of sorts on the subject. He undoubtedly entertains the notion that someday he will himself build a colored light device better than anyone else's.

In spite of his technical knowledge and his "plans", the ICDIB is, and always will be essentially a non-creative person, or a "second-hander", and can never really get around to constructing any such device in actuality because somewhere inside of himself is that doubt that it just may reveal to the world his mediocrity. So his currency is words, and plans, and imaginary systems, never a reduction to practice. So his behavior is oriented toward discrediting or disrupting the existing creative efforts of others who while less technically able than he, are nonetheless considerably more creative and in motion.

The ICDIB works in one or both of two ways. Either he will ridicule your efforts, or he will offer to help you build a color effect "better" than the one **YOU** are building.

By subtly disparaging you, his modus operandi is to give himself imaginary altitude by degrading you and your color effects by showing his superior technical knowledge and paper skills. He delights in

pointing out to you that "you are doing it the hard way." He delights in technical name-dropping, and referring to technology and hardware that will invalidate you, like "why are you using that antique, obsolete thingamabob when any fool knows that a whoosisified whatchamaroodle would work MANY TIMES better..." His game is directed at making you feel totally inept, upstaged, and incompetent; and if you buy him at face value, his game will succeed. There is a sure-fire way to handle the superior and ridiculing ICDIB. Take him back DOWN the abstraction ladder. Inform him politely, firmly, and unequivocally that you prefer building your own instruments in your own way and you would be delighted if he would go ahead and build his own in his own way. Furthermore, you add, you would be delighted to compare the effects produced by yours with the effects produced by his when and if he ever completes something. He won't.

Sometimes an ICDIB who offers to "help" you construct an "improved" color device will thwart your efforts through the simple procedure of procrastination. He will keep you waiting, and when you remind him, he will provide a perfectly reasonable excuse for the delay. If pressed, he will counter by saying that he is working up an even better model than the first one which hasn't been built yet, and as time goes on, his unbuilt models become better and better until they are far superior to anything ever existing in the real universe. We've met ICDIB's who actually BELIEVED this!

There probably exist today in the fantasies of "helping" ICDIBS literally millions of unbuilt color machines, each of which, of course, is so much "better" than any of the others.

In the real universe, however, one antiquated, crude, primitive functioning color instrument is infinitely better than all of the unbuilt models in the universe !

You may be able to outfox a sincere ICDIB by somehow getting his agreement that he will just go ahead and build his first color device simply and as planned, getting his agreement to postpone improvements until his SECOND machine is underway and (2) somehow get him to agree to a strict deadline for completion of the first device, such as a bet or a dare. The chances are almost certain that he will not meet the deadline or ever complete it, but it will insure his future silence.

If you are hooked, and seriously intend to play the color game, the sooner you recognize and get tough with the spoilers, the happier you and everyone around you will be. Do not be deceived by their apparently good intentions, their game is to spoil your game.

INTERNAL TRAPS are sometimes hang-ups.

You can thwart your own efforts by becoming victims of the external trappers, therefore defeating your own efforts by unconsciously putting yourself in a position where you can "blame" the other person.

And don't get caught up in your fantasies about building better and more complex effects. This leads to a state of non-productive inactivity. The only color devices that fly are the ones that get built.

Another internal trap is turning yourself into a color prima donna. We've known a few mystical types who have fallen into the bag of deluding themselves that they have somehow been chosen by the Powers that Be to bring the message of Color to suffering humanity. This New Age Miracle should be disseminated in the Temples, and You are the Messenger. The end state of this bag is a paranoia where the player fearfully hides the color devices in the hall closet apprehensive that someone else might come and discover the principle and steal the idea.

"Color Heads" have been observed to fall into the internal trap of excessive jealousy which grows out of comparing their color devices with the work of others. And the end result is the tight bind of paranoia rather than the desired expanded awareness.

Good luck !



## This Shout of wonder...

robert moore williams

Swimming in the dark sea before dawn in a time of long ago, some of us, by prodigious individual efforts and by help from above, managed to leap above the surface of the waters and to glimpse, colorful and glorious upon the horizon, the sunrise of the coming day.

Just a glimpse was all we had of it. Then, with great salty splashes, we fell back into the sea.

Trying to tell the other fish what we had glimpsed, we found that all we could really say was that something was coming. It was so wonderful, so glorious, so filled with bright colors, that we could not adequately describe it. What it was we did not know, but we tried to talk about it so that others might take heart in hearing this good news of a coming new day.

"Isn't the old day good enough?" our critics demanded. "This talk of a coming new day is treason. Being a fish is the best possible way of life!"

Laws were passed to throw to the sharks all those who thought that life in the sea could be improved.

From these laws, we learned not to talk to strangers. But we knew we had seen something. This we would never forget! Working as individuals, alone and in silence, we tried to find out more about this great light and about these glorious colors that were above the water. Wanting to live in the beauty we had glimpsed, we were willing to work to make our dreams come true. Our tools were poor ones - muck, and sea-ooze, and faith - but we worked with the tools we had, seeking clearer vision, better understanding. The Light leading us, we found a thing we had not known existed. We called it land. Shedding our tails and closing our gill-clefts, we learned to live on this thing called land, to breathe air instead of water, and to see stars instead of muck and sea-ooze.

More millions of years than can be counted went into this work, but eventually we became something called men. Living on the land, we learned to work with dust and with mud, seeking thus to build a bridge to those far-away shining lights called stars.

It would seem, perhaps, that to be a man is the highest possible achievement, but there are now among us those who are talking of something greater....

Have you ever seen a great cathedral when the sun was shining through the stained glass windows in such a way that the whole interior of the vast structure seemed a single blaze of glory? As you felt emotions respond in you, did you perhaps wonder what was in the mind of the architect who planned this cathedral to include stained glass windows so that the interior of the church might be flooded with color? Was the architect trying to communicate in this way, was he trying to tell us a little something of a vision he had glimpsed?

There are those who claim that the cathedrals of the old world actually express a secret language and that these massive piles of stone and these slender finials rising toward the blue sky are an attempt to communicate with all who see them. If this is true, what is the message of the cathedrals? No words will convey the totality of this communication but we may surmise that it was spiritual talk, i.e., that it dealt with the growth process and with the means by which men could take another step upward - or perhaps several steps - along that infinite road that leads to mansions beyond the sky. Did the architect attempt to convey the heart of his message by means of stained glass windows?

Moving now to the personal level, I have a story to tell. This is my occupation. I am a writer, of science-fiction, though. I want to make clear that my meaning for this term is poles away from the meaning Hollywood has for it.

In August of 1962, about 5 o'clock in the morning, I was leaning against the top board of a big horse corral in Chatsworth, California, where I kept a roof over my head by working as a part-time caretaker of an estate. I was up early because many years of experience had taught me that writing is best done by me in the early morning. Two weanling colts nuzzled for carrots and looked hopefully at me through the fence but I had no carrots for them this morning. Behind me, on a neighboring ranch, a rooster was exulting in the dawn of a new day. Near at hand, a still sleepy bird was chirping. The tall eucalyptus trees on the winding drive were swaying in the rising dawn breeze. At the end of the horizon, the sky was the color of a gigantic pearl. Under the surface, my sub-vocal thought stream was yammering words - as it does for all of us - but I was not paying attention to it. Then the sub-vocal thought stream said, quite casually, "I am an I in a place of wonder."

These words got my attention.

"Well!" I thought. "What kind of propaganda is this? A place of wonder? This is the big horse corral! I can smell it as clear as anything ---"

Perhaps the words were only a calling card tossed into my mind by an unseen something which stood nearby. Perhaps my own mind made them up to fit the morning and the mood. They seemed a little silly, did those words. But what came next seemed important, then and now.

What came next was love!

I know this sounds silly too, but I am acting here as a reporter telling what happened, not as a critic evaluating the events. What happened was --- love! It appeared somewhere under my heart and it moved upward, with power!

It was not the kind of love that seeks or demands a sexual expression, but was another variety, the type that makes of all of this world--even the big horse corral -- a place of wonder. In its indulgent benevolence is magic and awe and reverence - for all of this mighty universe.

Because there was no obvious source, I thought of this as being the love of God. This, however, is only a way of saying that I don't know the source from which it came. I lived alone, and except for the two colts nuzzling for carrots, I was alone in this dawn of an August day. If some angelic being from some other level of existence stood near me this morning, with enough love in him to give a little of it to a human being, I could not see or sense my guest. At the time this happened, I was unfamiliar, with the meaning of Agape, which blends a feeling of wonder, awe, and reverence for all of the universe with the love that gives with no thought of return to the giver and with no regard to the merit of the receiver.

As this love poured into me, floods of tears began to run down my face. I let them run. Indeed, what could I have done to stop them? When this love came into me, it washed out all fear, all hate, and all pain - for the time being--and it made meaningful every action and every thought, filling all the world with the sounds and the sights of joy. When this love is in a person, even the horse corral becomes a place of wonder!

Once tasted, this love becomes of monumental importance, to be sought until it is found forever. Unfortunately, like all of the emotions, it fades away. The question then becomes how to get it back.

As the dawn became morning on this August day in Chatsworth, this love began to fade in me. Here was cause for real grief - but now

there were no tears. As it began to slip away, it seemed to me that all of the good things in the universe were going too, all beauty, all joy, all wonder, all gladness, all happy sounds. The colts stopped wanting carrots and moved to the far side of the corral and hunted for dry grass - and looked reproachfully at me. The rooster at the neighboring ranch stopped his exultant crowing. Traffic muttered ominously in the distance and smog began to creep along the ground from the distant freeway.

Beside my driveway the sunflowers grew tall. Quite by accident, it seemed to me, I looked at one of the golden blooms, concentrated on it, and saw it fully without really seeing it at all. Simultaneously, like a trout flashing upward toward a surface-floating bug, a pulse of this love leaped to the surface of my mind.

In this moment, in Chatsworth, California, I raised the shout of wonder! This love was correlated, somehow, with color!

Later in the day, and during the days that followed, I discovered that if I would concentrate on the colors then present in the abundant flowers, the gold of the sunflowers, the red of the roses, the green of the leaves with the sun shining through them, the red and gold leaves of the sycamores, the brown leaves of the oaks, even the blue of the far-away sky, this love would return to the fringes of my conscious mind. True, it would not return with the power of its first burst, but I would catch a whisper of it at the deep levels of my mind.

In other words, love and color were correlated, not just in my mind, but in nature. When one came into existence, the other was not far away.

Had I caught a whisper of the message that was in the minds of the cathedral builders when they put stained glass windows in those great Gothic structures in Europe? Had they used color to rouse echoes of divine love within the hearts of the worshippers?

Looking at the world of nature, I saw color everywhere. Usually unobtrusive, it seemed to be a quality always waiting quietly in the wings but eager to come rushing on-stage in breathless joy. In the spring, a young man in love might take his girl a bundle of jonquils. In the summer he might take her red roses. In the fall, he might take her yellow mums. The tired business man who remembered to take home a bouquet to his equally tired wife, usually found he had something magical going for him. No, it wasn't just the attention to which the women were reacting favorably. The color of the flowers had something to do with it.

I remember another experience. In the desert north of Phoenix many years ago, I a-wakened from sleep to find a sunburst of colors shining inside my head. As the colors faded, a white light took their place. I had never seen such a light before in all my life, but I recognized it instantly, and started toward it. How could I recognize something I had never seen before? I do not know. I am reporting, not explaining. But one thing I know, never in all the infinities that lie ahead will I forget that white light. It lies beyond the colors, perhaps the colors emerge from it, perhaps they return to it and are blended again into one.

Here, of course, I am on speculative grounds. But is any man ever on any other grounds? Though I have an enormous respect for science, I do not for one instant believe it can stand alone. My purpose here is to reach the emotions, so that reason and love can go hand in hand together, not one being sacrificed for the other.

On that morning in Chatsworth when I discovered that concentrating on the colors of the flowers would bring back to the surface of my mind a pulse of the love I had experienced, the desire for the device I call the colorscope was born. If color would bring back that love, I would saturate myself in color. I wanted color in living, moving, ever-changing forms on every inner wall of the house where I lived. I wanted it in my bedroom, so that if I a-wakened in the night a flick of a switch would show me anew the wonder I had experienced the morning when that strange calling card had been tossed into my mind. I wanted it just beyond my typewriter, so that lifting my eyes from the keys would show me always changing color patterns, always different and always new. I also wanted music in the background.

My interest, however, was not primarily in color. It was a means to an end, a bridge to that emotion which I called 'the love of God.' As simply as can be stated, all the effort that has gone into the development of the colorsopes is a part of the creature's search for the Creator. It is not all of that search any more than the stained glass windows are all of the cathedrals. just part of it.

At the time of the experience in Chatsworth, I had seen a demonstration of a color projector made from an article published in a national magazine. With this as a starting point, and with the whole-hearted help of many, many friends, I went on to other developments. I did not invent the colorsopes. All I want to say about me is that I seem to be a microscopically small part of the weaving of a vast pattern that

has its origin in other, higher worlds and which has as part of its purpose, perhaps, the re-awakening within human hearts of that quality of divine love which sleeps in every man. For me, it is honor enough to know that through me this weaving flows. It also flows through every other human too, though it may be sleeping in many. Sooner or later one of its messengers will toss a calling card into the sleeper's mind - and the wonder within will wake to life.

I had leaped - probably I had been helped to leap - above the sea of air. One result of this leap is that now I make colorsopes, as a hobby, as a fun thing to do when my fingers have grown tired of searching for the right typewriter key. If you decide you want a colorscope, I won't tell you that such a device will bring the love of God to wakefulness within you. It is my guess that you have to help with that awakening. The methods for doing this are thousands of years old and are in all of the world's scriptures. Choose the one that pleases you - and work with it.

During the past year, I have put on a small weekly color show which has combined the use of several colorsopes with good music. Perhaps 2,000 people have seen these shows. Ninety per cent of the audience have expressed to me their appreciation of this display of color. These people were not politely murmuring, "Thanks for a nice show," but were saying they had been emotionally moved. While the reaction to the colorsopes is individual, and varies from person to person, the general effect has been a gentle relaxation. Moving pastel color patterns seem to produce this effect and it is probably in the area of gentle relaxation that the colorsopes will find their widest use. On the other hand, however, and flouting my efforts to discover a general rule, there are those people who have been stimulated by the displays. Then, once, there was this reaction:

"I was watching my colorscope while lying in bed," this woman told me. "No, really, I can't describe my emotions except to say a kind of ecstasy seemed to be moving through my whole body. Yes, this was love, but not like any meaning I have ever had for this word before. As the motion became more and more intense, the moving colors seemed to fade away and there on the screen was Jesus!"

My guess is that love in its highest possible meaning for her at that time was in her consciousness. Since Jesus was associated in her mind with the highest and the finest, she projected the image that fitted the love.

If we use the best there is in us to seek the best in the universe, perhaps the universe

may send back its best to us.

As I write these lines, my stereo is softly reproducing Mozart's horn concertos. When I lift my eyes from my typewriter, a colorscope sitting on a bridge table is projecting soft and gentle images through a translucent screen. Many times during the day, in looking up, I feel in my mind a whisper of that love which makes of all the world a place of wonder.

Similarity is one of the ways in which thoughts are associated in the human mind. This rule of association has found expression in a bit of folk wisdom, which says, 'Birds of a feather flock together.' Does a mind bigger than the human work in our daily lives, bringing us into contact with people and with events, on the basis of similarity?

No one can answer this question positively but many feel that such a mind does exist and does work in this way. Built on this concept, one of my private fantasies is that when enough colorsopes are in operation, this greater mind in which we live and move and have our being, and which for reasons of its own has chosen us as channels for the expression of its love, will some night collapse space between us, and though we are thousands of miles apart, we shall find we are sitting at a common table.

Thirty years ago I was writing fantasies about rocket ships. Today, these clumsy craft are circling the planet and are bouncing off the moon. Shall we jump thirty years into the future again, to see what has happened to the colorsopes?

Countdown! Three, two, one ---

What is that stuff on the floor, you ask? That is sawdust. And that tang in the air is coming from beer. That noise in the backroom is coming from a fight. The enormous rumble that shakes the floor is coming from a rocket ship blasting off for Mars. The men who frequent this little saloon build and man these sky ships. There behind the bar is a colorscope. The owner of the saloon bought it because his wife thought it was kind of pretty. After it was installed, the engineers from the rocket ship plant discovered it reduced the incidence of fights in this fierce little saloon by 17.3 per cent. They are getting signatures to a petition to have colorsopes installed in the main assembly room of the United Nations!

Shall we jump to some other place in 1996?

A theater built in the shape of a sphere, with the inner wall a translucent screen blazing

color forms. In this theater where an audience watches in utter silence, a flute is whispering. A harp answers the flute and the two instruments drip honey notes into the glowing colors. Perfume comes into the air and you visualize violets blooming in hidden nooks in the deep woods. Now the music changes and the colors begin to dance with it, so that you wonder whether the music is creating the colors or the colors are creating the music. A soft blue hue appears on the inner wall and you begin to think of the blue of far-away skies. What is that music they are playing? That's the Star Symphony. You never heard it before? It wasn't written in 1966. Who will write it? I don't know his name but I know his type. He will belong to the same breed as the stranger who came into a color show I was putting on down in the hills of the North County one night. This man sat very quietly for a while, watching the moving color, then he reached down into the satchel he had brought with him and took out the type of flute called a recorder, which he began to play — as the color inspired him.

So, perhaps, will the Star Symphony be written, by somebody who will wander in out of the night and will see a color show for the first time.

On this planet a wind is blowing that never blew before. All I was doing was leaning my elbows on the top rail of the big horse corral when this wind blew through me. In its own time, it will blow through the right musician — and the Star Symphony will be written.

Shall we leave this magnificent color theater of 1996 and see what is happening elsewhere? Into a private home this time, to see a white-haired woman who is all alone, watching the colorscope of the future, while the Star Symphony plays softly in the background.

I am proud, and very, very humble, for having helped write this story, and I shall think of all of these places, privately, as being Temples of Agape, where a human may restore within himself the divine love which he uses up in his daily life, as places where color, music, and a human conspire to leap above the smog that now fills what was once the clear, clear air of our planet.....

Now that we are called men, we live in this sea of air. Again there are those of us — more of us than you may think — who, by prodigious individual efforts and by help from above, are managing to leap above the surface of this sea of air, and to glimpse, colorful and glorious upon the horizon, the sunrise of another, different coming day.

We just get glimpses of it, we don't see it clearly, we don't understand it very well; but we know it is a new world, a new day, a new age. When we return to our ordinary life, we try to report what we have seen, but about all we can say is that above the sea of air is still another sea of finer, brighter stuff. In this sea, the sunrise of a new day now is moving toward us.

Remembering how we were thrown to the sharks in the time of long ago, we tell our critics in advance that our stories of the coming new day are really only tall tales, burst of imaginative fantasy brewed in a cauldron made of wonder. The critics themselves can decide where fact left off and fantasy began. Through long experience with it, we feel we can guarantee that this problem will wither the wits of the oldest critic alive, and may even give pause to some of the young ones, who seem reluctant to understand how much we live by fiction, how little by fact, even in our daily lives.

Knowing they are sincere, honest, and well-meaning, we do not talk back to our critics. Or not much. We think that what they want most of all is to see the sunrise, that back of all of their criticism is a great secret yearning for the vision of the coming glory.

While they yearn, we work with the new tools that science has now given us --- keeping only the most ancient tool of all, faith---trying to learn how to build the new wings of gossamer we will use in that crystal sea which is made of finer, brighter stuff than air.

As we build these wings — and we do get them built — this finer, brighter stuff comes down and fills them. It delights in finding wings to fill — and waits to fill them only on their building.

Always, when our best comes up from below, the best comes down from above, to meet our best, to greet it, and to make it welcome.

Where that which lifts itself from below meets that which comes down from above, there is the sunrise of the new day, colorful and glorious upon the horizon.

We make ready our wings.

Wings of gossamer, wings for those who will be builders in the land where the dust is diamond bright!

Wings for those who will raise the shout of wonder in tomorrow's sky.

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This piece has been written for those who have seen or who anticipate seeing the simple color-scopes made as a hobby by the author - or for those who have seen or who anticipate seeing the much more elaborate coloramas put on by ---- Bob Beck - also as a hobby - in the Experiential Theater of Hollywood.

## Light Shows

**bob  
beck**

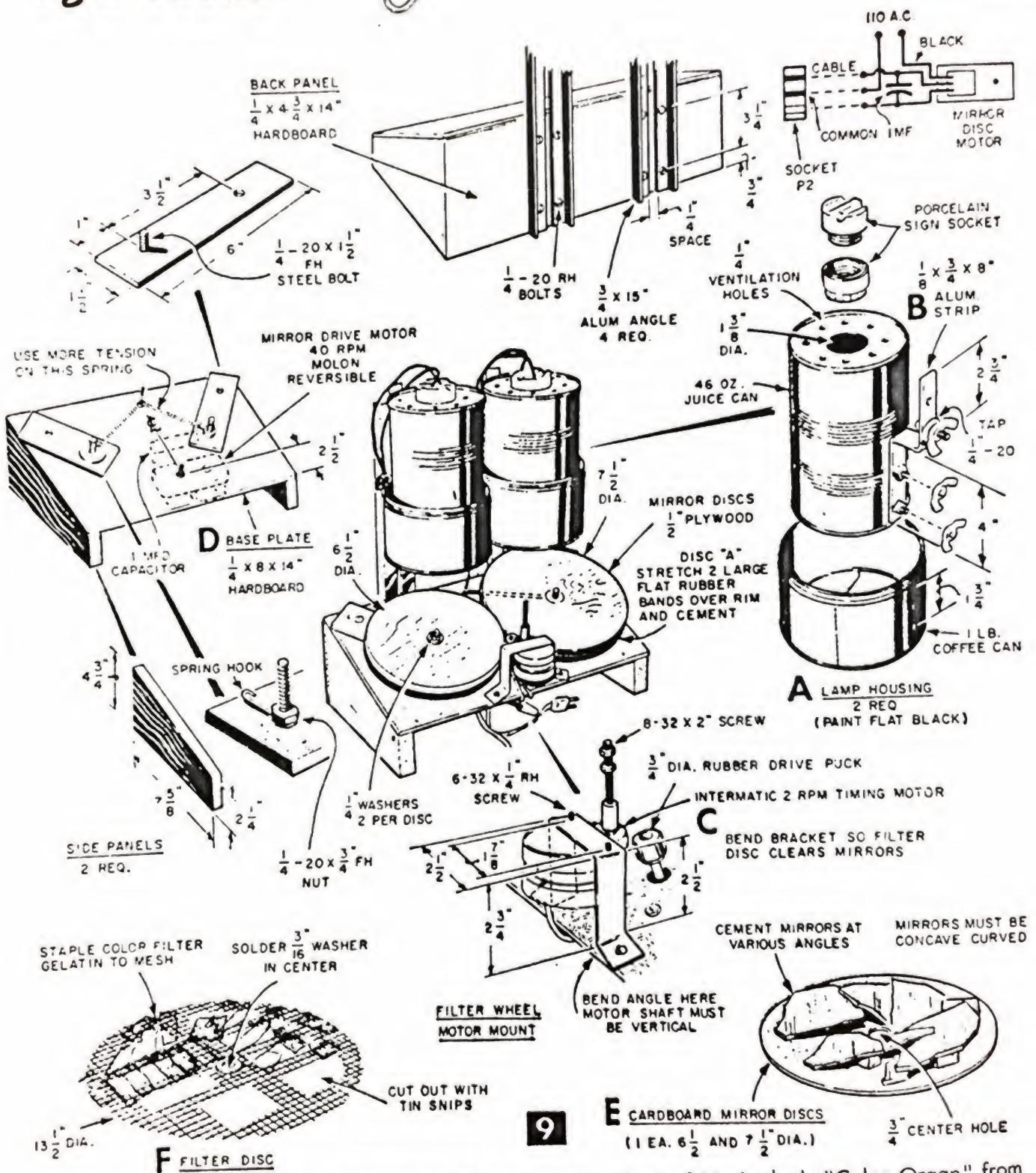
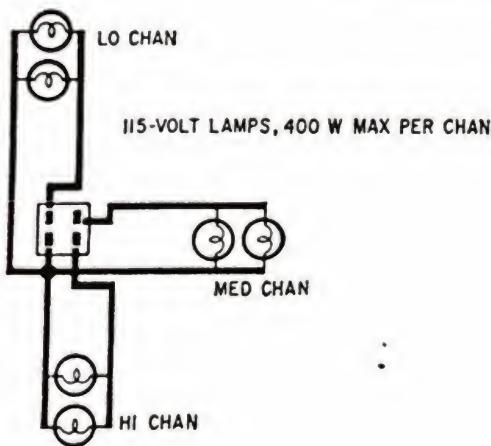
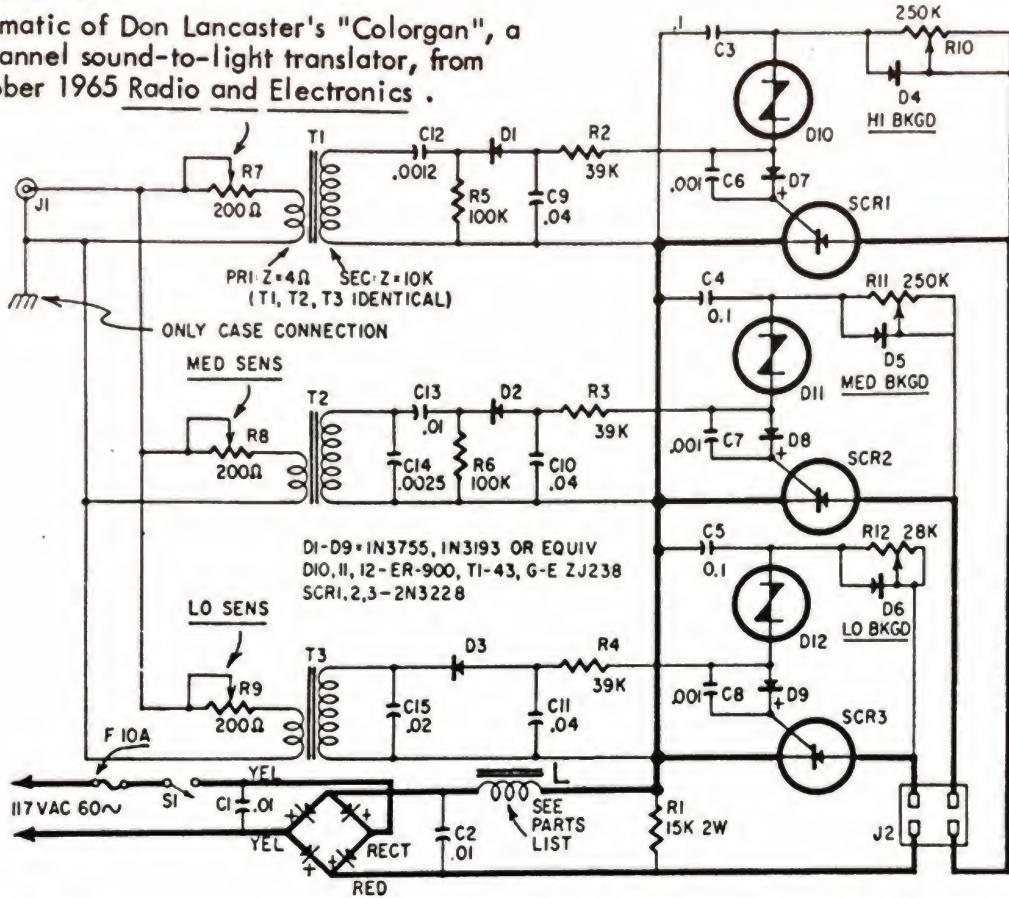


Illustration of construction plans of Musicolor's "Color Organ" from December, 1960 issue of Science and Mechanics Magazine.

## Light Shows 27

Schematic of Don Lancaster's "Colorgan", a 3-channel sound-to-light translator, from October 1965 Radio and Electronics .

bob  
beck



C1, C2, C13—.01- $\mu$  600-volt disc ceramic  
 C3, C4, C5—0.1- $\mu$  400-volt paper or Mylar  
 C6, C7, C8—.001- $\mu$  600-volt disc ceramic  
 C9, C10, C11—.04- $\mu$  600-volts (two .02  $\mu$  disc  
 ceramic in parallel)  
 C12—.0012- $\mu$  disc ceramic  
 C14—.0025- $\mu$  disc ceramic  
 C15—.02- $\mu$  disc ceramic  
 D1 through D9—silicon diode, at least 100 ma,  
 200 volts (RCA 1N3755, 1N3193 or equiv-  
 alent)

D10, D11, D12—30-volt avalanche trigger diode (Transitron ER-900, Texas Instruments TI-43, G-E ZJ238 or ST2 or equivalent)

F—10-ampere fuse

J1—phono jack

J2—4-prong socket (Jones S304 AB)

L—22 turns No. 20 enameled wire on Arnold core No. A 930157-2; 60  $\mu$ h approximate inductance (optional interference filter—see text). Core is available for \$1 postpaid from Clare M. Dahl, Dept. Q, 2237 West Glenerosa Ave., Phoenix, Ariz. 85015.

P—4-prong plug (Jones P304 CCT)

R1—15,000 ohms, 2 watts

R2, R3, R4—39,000 ohms,  $\frac{1}{2}$  watt

R5, R6—100,000 ohms,  $\frac{1}{2}$  watt

R7, R8, R9—pot, 200 ohms (Centralab TT-2)

R10, R11, R12—pot, 250,000 ohms (Centralab TT-50)

RECT—10-amp 200-volt full-wave bridge rectifier (Motorola MDA962-3 or equivalent)

S—10-amp, 250-volt spst rocker switch

SCR1, 2, 3—2N3228 silicon controlled rectifier (RCA)

T1, T2, T3—transistor output transformer: 4-ohm primary, 10,000-ohm secondary (Stancor TA-33, Knight 62 G 363, Argonne AR-133 or equivalent)

Heat sinks for SCR's (3)—Daedalus type 600 blank heat sink; Daedalus Co., 129½ Ronscrans Ave., Manhattan Beach, Calif. (\$0.29 each plus postage.)

Case, panel, knobs, hardware—see text, drawings and photos

# Light Shows

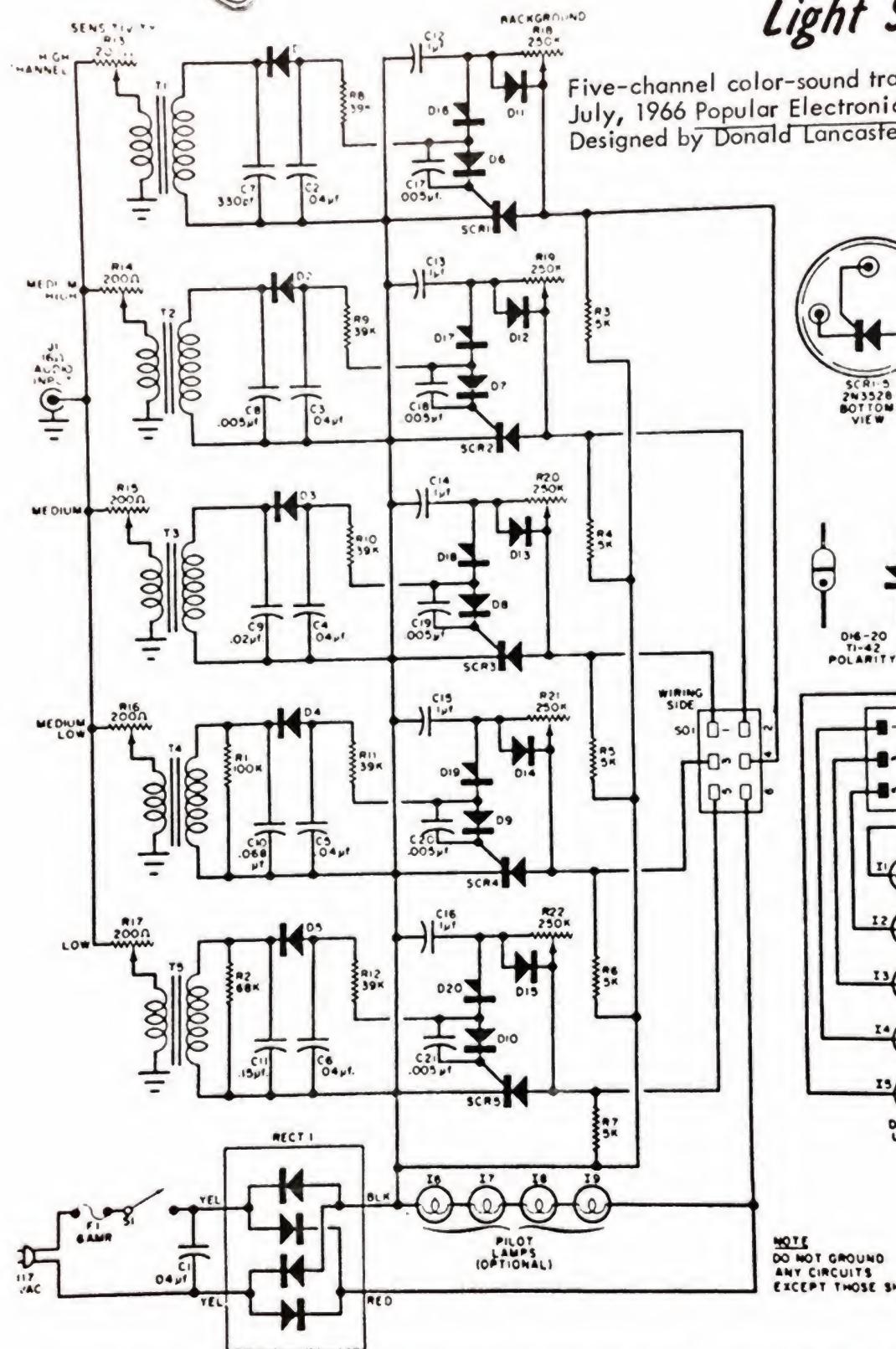


Fig. 3. Overall circuit of five-channel color organ is made up of five basic circuits easily identified by individual input transformers (T1 through T5). Each circuit operates its own display lamp.

## Light Shows

29



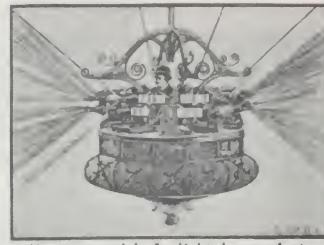
THE FIRST! Professor A. Wallace Rimington's color organ. "Mobile Colour" concerts were performed in England by him in 1893.



Mrs. Mary Rofford-Greenwall and her color-organ during the 1920's and 30's.



Early kaleidoscopic color organ with cylinder Edison phonograph and kerosine lantern projector, late 1800's.



Hanging gondola for light show projectors over 100 years ago.



"Color Organ", the rage of Paris 100 years ago. Illuminating gas jets inside tinted glass organ pipes were played by keyboard. As flame burned higher, it would suck air through the pipe and produce tones. High register was hung like chandelier from ceiling. Each note had one color.



Visitors to Charles Singletary's studio enjoy mobile light concert, 1956.



Pattern from Charles Singletary's color-music concert.



Mr. Thomas Wilfred, pioneer American color composer, prepares a light composition during the 1920's.



Thomas Wilfred at keyboard of first portable "Clavilux" color organ used in public recitals in 1922.

bob  
beck

# Light Shows

30

## the crystal trip



Black and white still from Auroratone passage of Bing Crosby's "Home on the Range". Films were extensively used in Army hospitals for psychiatric treatment.



Cecil Stokes, promoter of the Auroratone process, explains his process of registering musical vibrations as color patterns on microscope plates.



Bing Crosby at microphone, Cecil Stokes, and Edward Dunstetter at organ perform live presentation of Auroratone light show in 1940's.

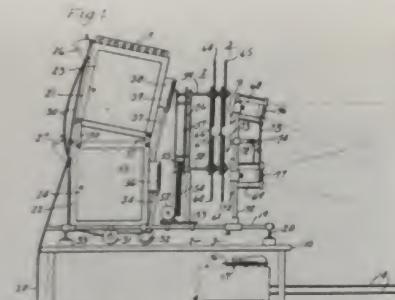


Stokes and his sound man discuss color show.

bob  
beck



One of the many enthusiastic full-page write-ups of the pre-psychedelic "Auroratone" music in color process. 1947.



Portion of Stoke's patent # 2,292,172 (8/4/1942) showing arc lamp projectors and crystal plates.



Bob Beck's modernized and improved "Auroratone" projector. Fully automated, transistorized, and self-contained, with the music translator at left. This projector is also the basis of "Trip" shows.

Part of the Experiential Theatre" program describing "The Crystal Trip" performed Dec. 17, 1966 at Aeronautical Sciences Institute Hall, Los Angeles.

An electronic color instrument was created by engineer-artist BOB BECK to experimentally induce interactions between sound vibrations, color images woven optically/electronically/chemically, and the psyche of an audience.

"Mother nature herself is the artist," says Bob. "My instrument will not project exactly the same kaleidoscopic images twice, since the interactions are highly sensitized and complex. It is fascinating to watch a feedback loop building up between the audience, the music, and images on our screen. This is why we do it live instead of on film. Often, the entire audience becomes involved and turns on."

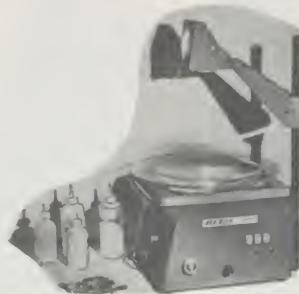
Crystal Trip is a modern improvement on the now legendary AURORATONE process of the pre-psychedelic 1940s, which film producer Cecil Stokes kept a closely guarded secret. The Crosby Foundation (Bing and Larry) purportedly invested thousands of dollars in Auroratone. Stokes' objective was to scientifically capture on color film a visual pattern of the translation of music into its visual patterns, and then use these films for therapy and openings of the psyche.

Many spectacular "feelings" and "openings" were reported not only in the press but in medical journals during Auroratone's day, but the secret process and prints disappeared after Stokes' death. Much research and experimental effort have gone into this re-birth of THE CRYSTAL TRIP which our audience will experience in live presentation tonight.

## Light Shows

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bob  
beck



"Travelgraph" overhead projector set up for wet show. Non-mixing colored liquids (oil, water) are pooled into larger dish, then smaller convex dish is "splashed" into the colors in bottom dish. Dyes are stored in plastic bottles.



Wet show at Dennis Wier's.



Frame from wet-show portion of Jean Mayo's "Psychedelic Experience" film.



Rear-projection 3-color shadow dance from Jean Mayo's film.



Another frame from award-winning 16 mm film "Psychedelic Experience".



Sheets hung from ceiling make screen at Acid Trip, San Francisco.



Projector station at "Acid Trip".



Projector station at "Freak Out", Shrine Auditorium.



Overall view of Shrine during "Freak Out".

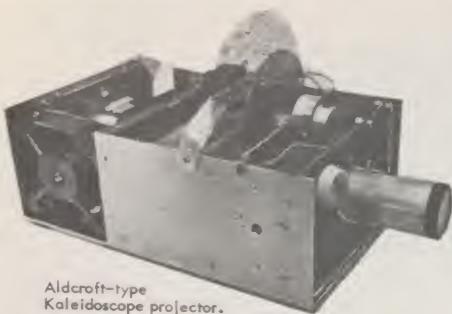


Huge bedsheet screen at Mothers of Invention show, L.A.



## Light Shows

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Aldcroft-type  
Kaleidoscope projector.



"Light Show" display behind title of KHJ's weekly  
"Boss City" show, coast to coast in color 6-7pm Sat.



Colorcasting Kaleidoscope in KHJ's Hollywood  
studios. Bob Beck's system.



Original 2-channel "Varnalume" and sound  
translator built by Bob Beck in 1960.



Dancers appearing at "Freak Out"  
under strobe lights, Shrine Hall, L.A.



Bob Williams- Jim Morrisett design  
color organ. Single channel.



Six foot section of "varnalume" display.



Dr. Henry Hill and screen of his color instrument.



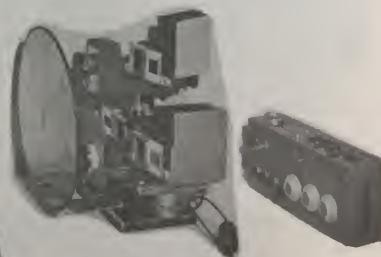
Inside the Williams color instrument.



Control Tower for lights and sound, S.F.'s "Acid  
Test" and "Trips Festival", Longshoremens Hall.



Inside the 4-channel  
"Varnalume 4".



First model of mind-blowing  
3-image projection system based on Carl Jung's  
race-memory symbology. At rt. is the translator.

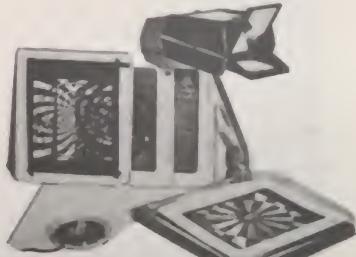
Jim Morrisett's latest  
color instrument.

bob  
beck

## Light Shows

33

bob  
beck



3-M's model "O-88" portable overhead projector, a high-efficiency, light-weight system for pattern projection on dancers.



Lovely Autumn blends with light show patterns on "Boss City" T.V. spectacular.



Elizabeth Cenciglio weaves dance patterns with Moire projection.



Judy Guy and Autumn perform for KHJ's Saturday T.V. spectacular, "Boss City".

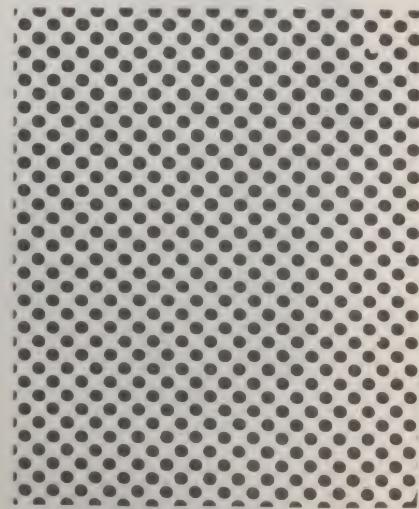
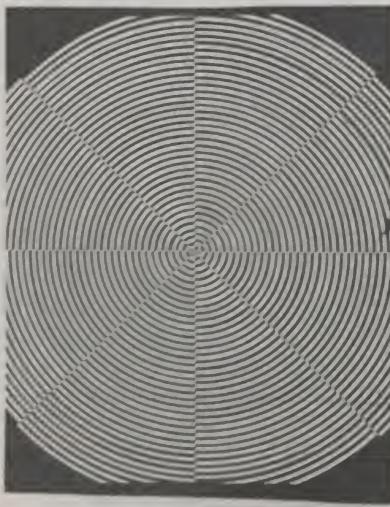
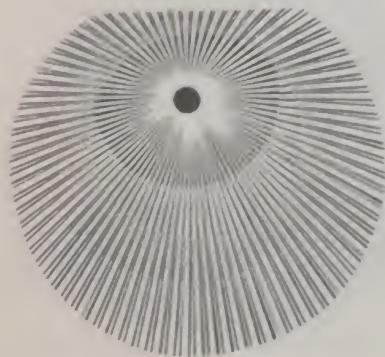


# Light Shows

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These selected patterns work well for overhead projection onto screens, 3-dimensional art constructions, etc. To make 8X10 transparencies from this page, shoot each image with any close-up attachment onto 35 mm negatives, then enlarge onto high-contrast litho film, and develop enlarged transps. Use prints. Or take this sheet to any shop making litho negs for offset printers. They will shoot each choice up to 8X10 for \$ 1.00 to \$ 3.00 each. Mount in overhead projector frames with masking tape.

bob  
beck

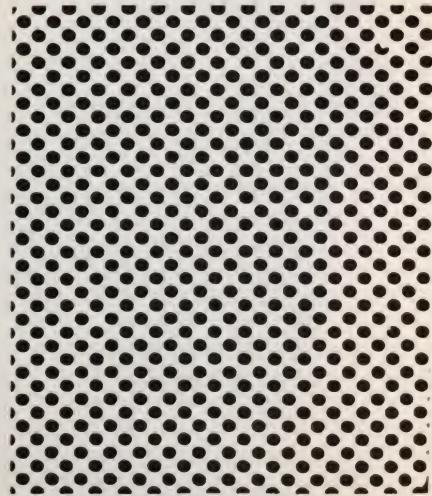
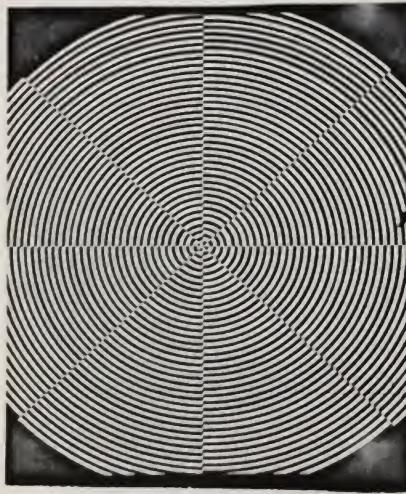
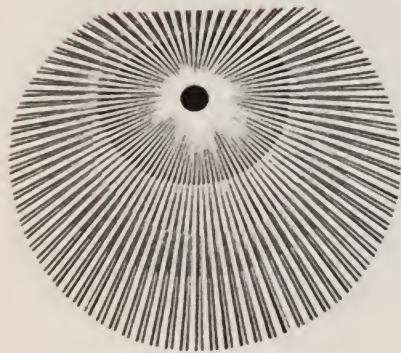
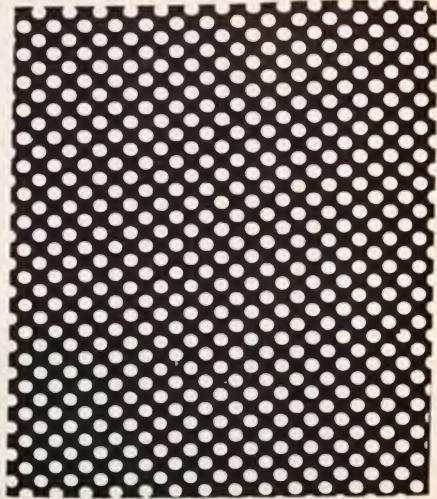
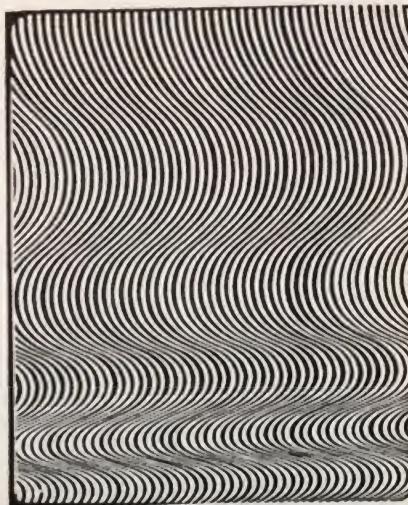


# Light Shows

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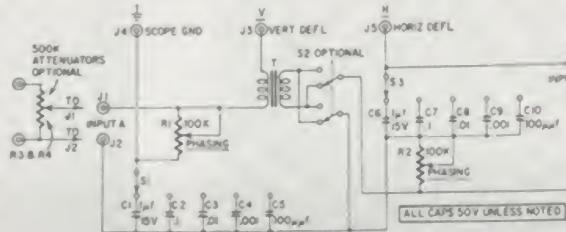
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bob  
beck



## CYCLOIDS

"Cycloid" patterns on oscilloscope screens are the basis of many experimental film techniques, such as Hy Hirsch's "Come Closer". Fascinating patterns are easily made in infinite variety with these circuits, taken from Radio Electronics magazine of July, 1965.



R1, R2—pot, 100,000 ohms  
 R3, R4—pot, 500,000 ohms (optional)  
 C1, C6, C11, C12—0.1  $\mu$ F  
 C2, C3, C8, C13, C18—0.01  $\mu$ F  
 C4, C9, C14, C19—0.001  $\mu$ F  
 C5, C10, C15, C20—100  $\mu$ F  
 All capacitors 50V unless noted  
 All resistors 1/2 watt unless noted  
 J1, J2, J3, J4, J5, J6, J7—3-way binding posts  
 S1, S2—single pole 3-position rotary switch  
 S2—dpdt toggle (optional)  
 T1—audio transformer, high impedance, 1:1 up to 3:1  
 (ratio not critical)  
 Plastic box and cover, 3 1/2 x 6 x 2 inches  
 Miscellaneous hardware

Fig. 1—Circuit of simple scope adapter that will permit you to display cycloids

R1, R2—pot, 300,000 ohms  
 R3, R4—dual pot, 100,000 ohms per section, linear  
 R5, R6—100,000 ohms, 1/2 watt  
 C1, C6, C11, C12—0.1  $\mu$ F  
 C2, C3, C8, C13, C18—0.01  $\mu$ F  
 C4, C9, C14, C19—0.001  $\mu$ F  
 C5, C10, C15, C20—100  $\mu$ F  
 All capacitors 50V

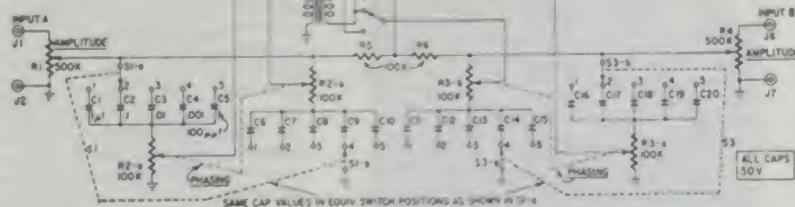


Fig. 2—A more refined version of the adapter shown in Fig. 1.

J1, J2, J3, J4, J5, J6, J7—3-way binding posts  
 S1, S2—single pole 3-position rotary switch  
 T1, T2—audio transformer, high impedance, 1:1 ratio (if not available, connect high impedance transformer to scope)  
 (Use to suit)  
 Miscellaneous hardware

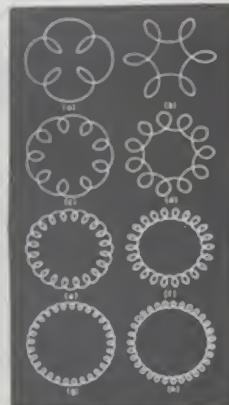


Fig. 3—Cycloid patterns (all cycloids for 1:1 ratio, 50V supply). (a)—single loop; (b)—two loops; (c)—three loops; (d)—four loops; (e)—five loops; (f)—six loops; (g)—seven loops; (h)—eight loops; (i)—nine loops; (j)—ten loops

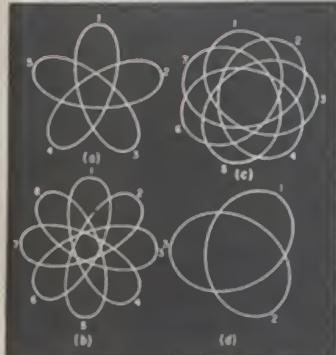


Fig. 5—Outside loop patterns showing ratios of lines less than 1:1. a—2:3; b—3:5; c—2:5; d—1:2.



Mechanical production of Cycloids and Harmonographs in the 1880's

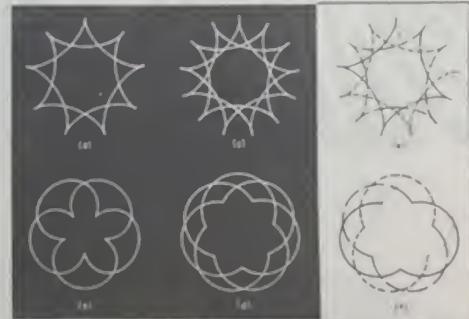
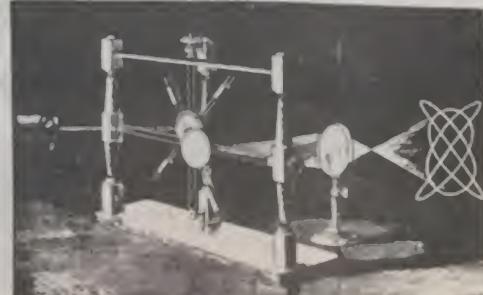
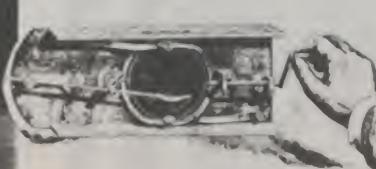
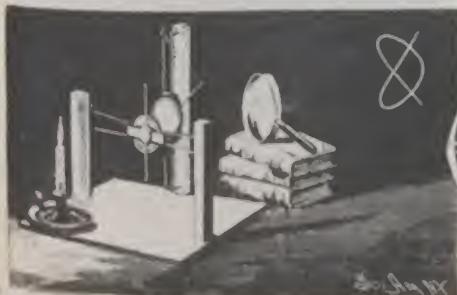


Fig. 6a, b—Outside and inside loop patterns for 1:1 ratio, 50V supply. (a)—1 ratio; (b)—figures 6 and 7 redrawn in their number of overlaps. To calculate with short-dash line and on around, count clockwise in 6 and clockwise in 7. Count short-dash path at one lap, next, long-dash, then solid-leading edge. Dashed line completes figure and is not counted.



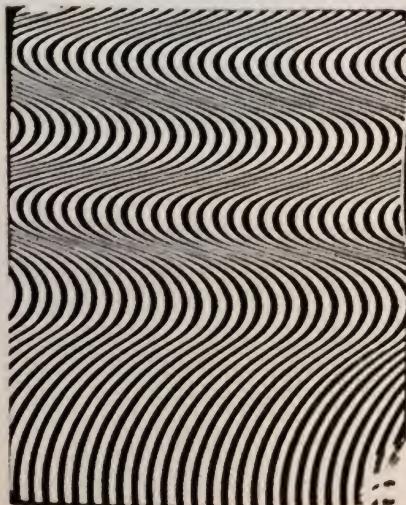
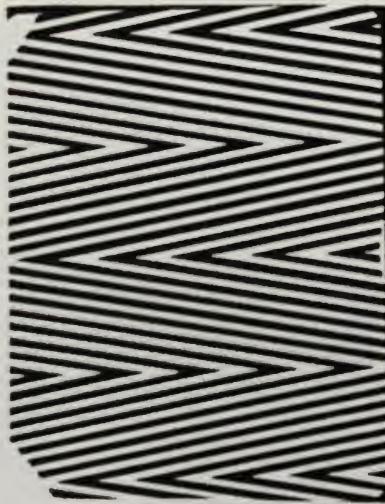
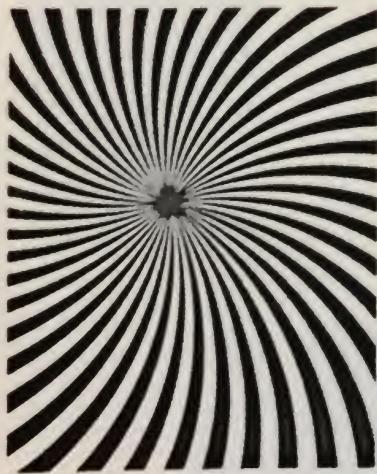
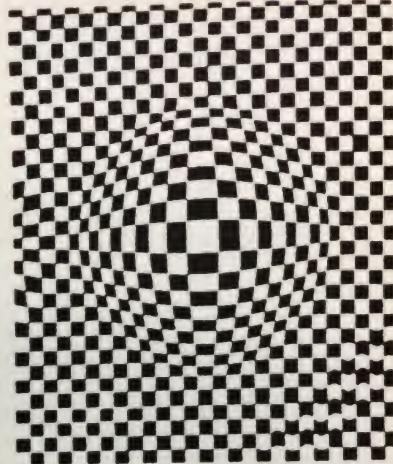
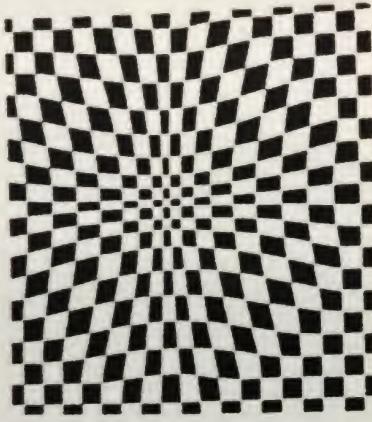
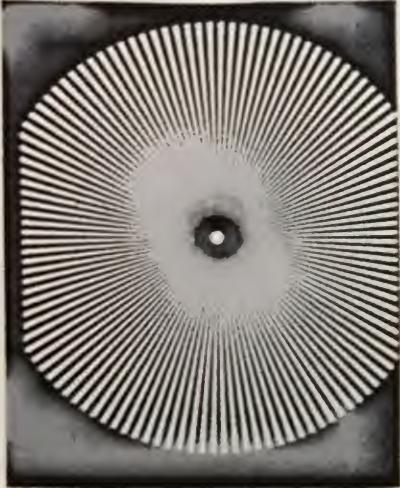
bob  
beck

# Light Shows

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bob  
beck

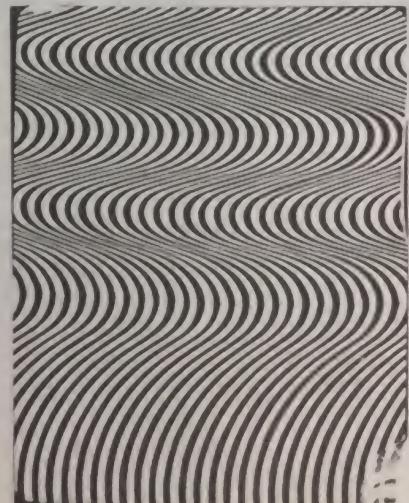
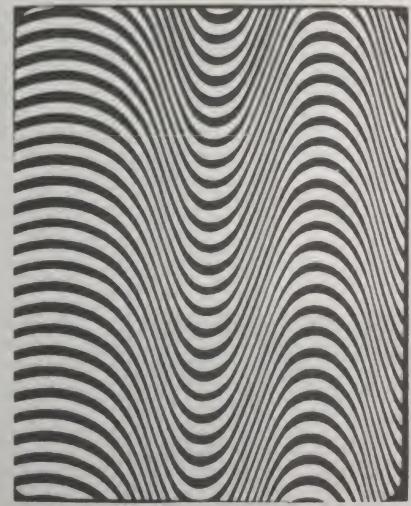
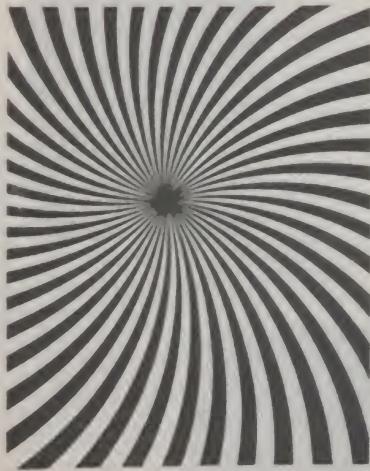
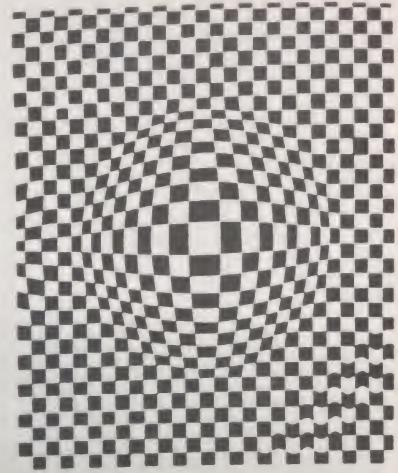
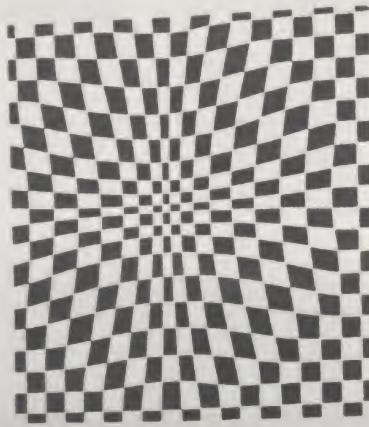
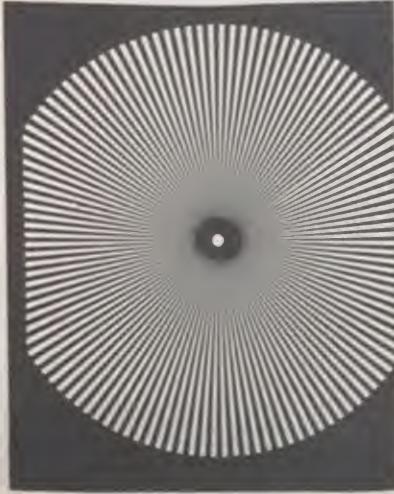


# Light Shows

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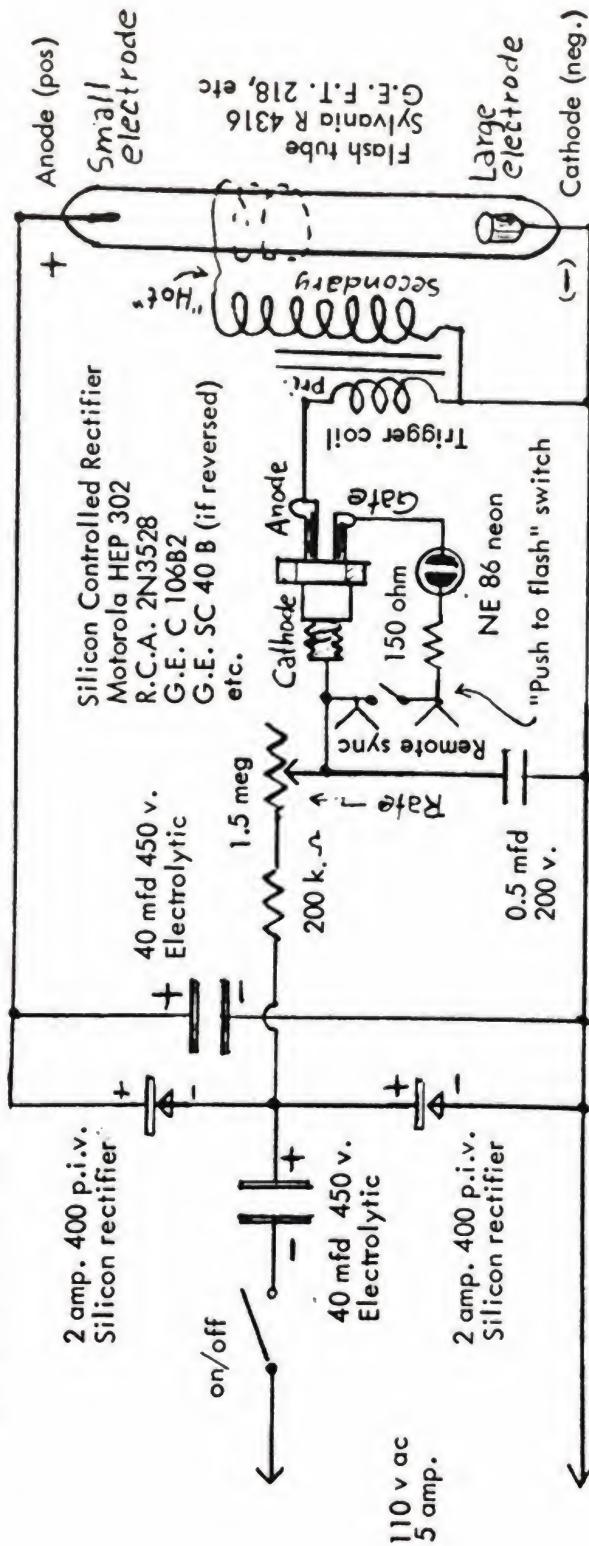
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bob  
beck

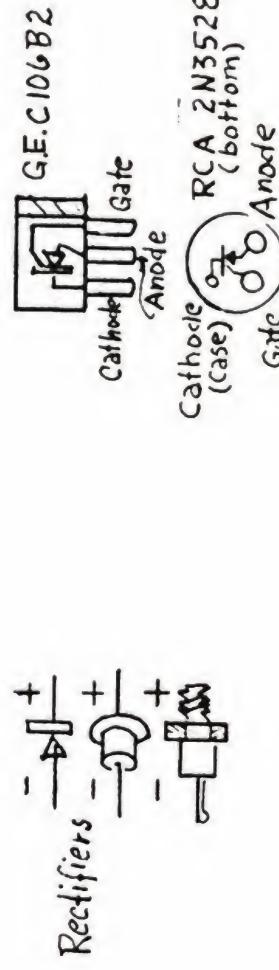


## Light Shows

**HIGH-INTENSITY** miniature strobe designed by Bob Beck for use in professional motion-picture sequences. Light output is 15-20 times that of previous "psychedelic" and industrial strobes, however unit can be run for only 4 to 5 minutes continuously, since a tremendous amount of heat is dissipated by the lamp. Electrolytic capacitors store much more energy (watt-seconds) of power than oil-filled types, but they have a limited life expectancy, compared as to size and weight. These units are easily hand-held to follow the camera action during filming. Components cost about \$ 20.00. The Sylvania R-4316 lamp outlasts any others tested in this application. The trigger coil must be made by winding 10-15 turns of plastic insulated stranded wire around the ground end of Miller # 6310 ferrite-core R F choke coil. The "High" or outside end of the choke winding is disconnected from the pigtail, soldered to another insulated length of hook-up wire, and is connected to the trigger tickler of flash tube. Commercial trigger coils are erratic, as they do not present enough inductance to the SCR firing pulse oscillator. This coil, however, provides a very high step-up ratio of ionizing surge potential and will fire the "slowest" flash tubes.



S.C.R.s

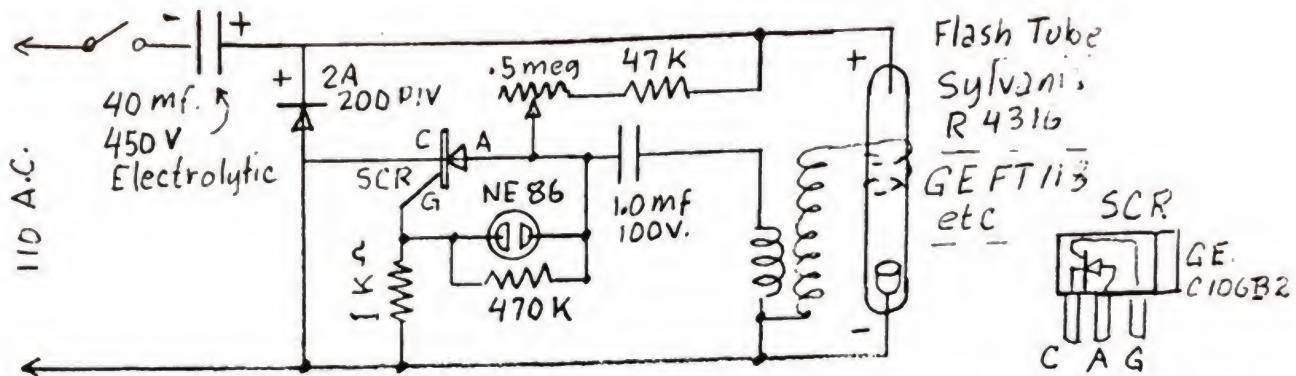


pg. 37

bob  
beck

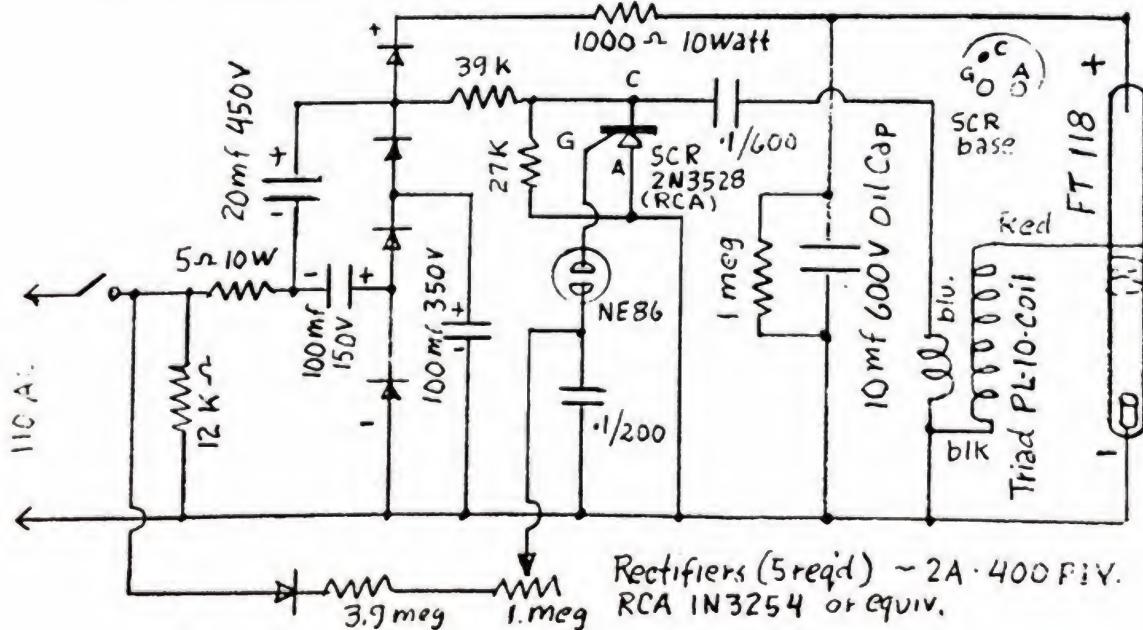
# Light Shows

pg. 38  
bob  
beck



ABOVE: The "Simplest Possible" electronic strobe (at this writing). High output, smallest number of parts. Bob Beck designed this "novelty" strobe at the request of persons wanting the cheapest possible device. A pseudo voltage doubler uses the 110 A.C. line as the other leg of the high voltage circuit on each 1/60 th second of the line voltage cycle, therefore the rate control must be carefully set to synchronize with the line frequency for any desired speed setting. Do not run for longer than five minutes, with brief period for cooling. Trigger coil must be the specially constructed 5-turn primary on Miller # 6310 R.F. choke described elsewhere. Almost any SCR will work in this circuit, but G.E.'s C 106 B2 is cheapest.

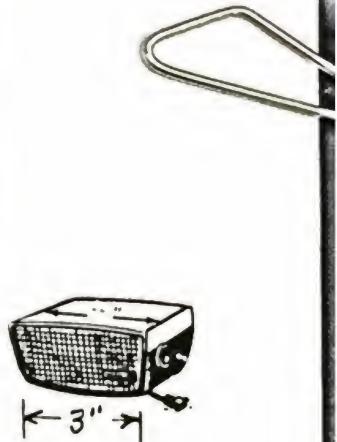
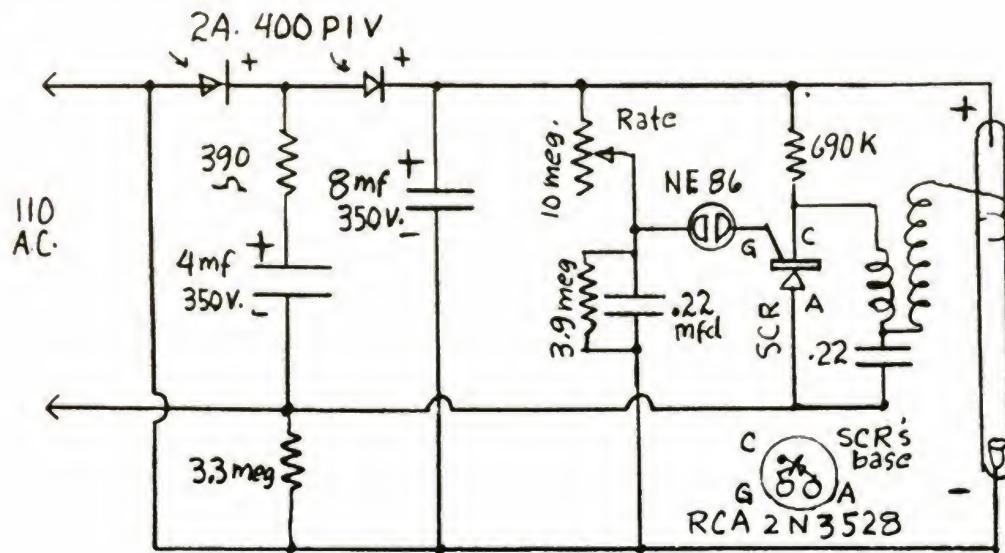
BELOW: The "most copied" strobe- originally designed by Marshall Buck and duplicated by several companies since. An excellent unit, of medium light intensity, and long life expectancy. Can be cycled continuously. Cost of parts under \$ 20.00, retails for about \$ 100.00. The transformerless, voltage-quadrupler circuit charges the 10 mfd OIL FILLED capacitor.



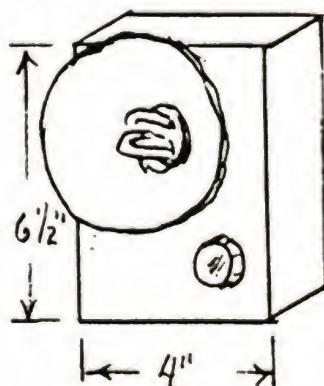
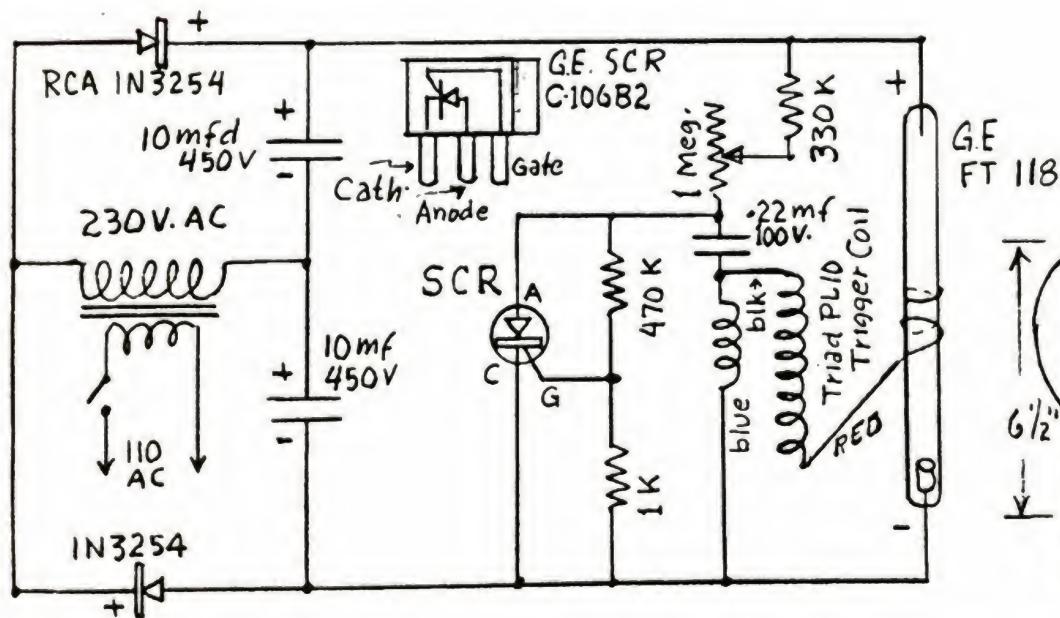
## *Light Shows*

pg. 39

bob  
beck



ABOVE: Schematic of Marshall Buck's original "Mini-Strobe". This palm-sized, vest-pocket strobe was reconstructed inside of a \$ 15.00 Japanese photoflash unit measuring only 3" X 1-3/4" X 2-1/2". Very limited light output, but flashing rate up to 20/sec.



ABOVE: A \$ 39.95 retail strobe introduced by Castle Lighting in Feb. 1968. Limited light output suitable for very small areas. As rate of flash increases, the light output decreases rapidly due to limited capacity of the transformer. Life expectancy of the electrolytic capacitors is questionable, however this is a good buy for the price.

## Light Shows

bob  
beck

pg. 40



Physical lay-out of  
strobe circuit on  
page 37. Standard  
plastic meter box is  
6-1/4 X 3-3/4 X 2"

